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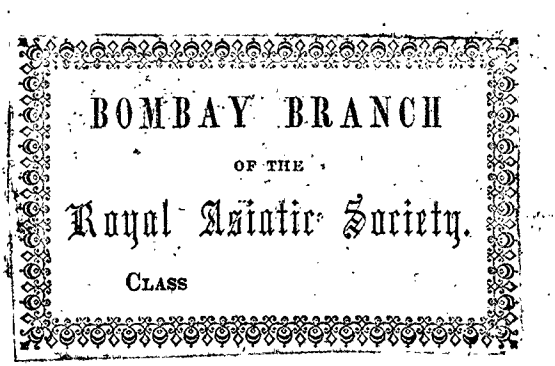

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AN

EXPEDITION

FROM PITTSBURGH

TO

THE ROCKY MOUNTAINS.

VOL. II.

LONDON:
Printed by A. & R. Spottiswoode,
New-Street-Square.

ACCOUNT

OF AN

EXPEDITION

FROM PITTSBURGH

TO

THE ROCKY MOUNTAINS,

PERFORMED

IN THE YEARS 1819, 1820.

BY ORDER OF THE

HON. J. C. CALHOUN, SECRETARY OF WAR,

E 4669

UNDER THE COMMAND OF

MAJ. S. H. LONG, OF THE U. S. TOP. ENGINEERS.

COMPILED

FROM THE NOTES OF MAJOR LONG, MR. T. SAY,

AND OTHER GENTLEMEN OF THE PARTY,

BY EDWIN JAMES,

BOTANIST AND GEOLOGIST TO THE EXPEDITION.

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EXPEDITION

FROM PITTSBURGH

TO THE ROCKY MOUNTAINS.

CHAPTER I.

DEATH — MOURNING FOR THE DECEASED — PHYSICAL CHARACTER — SENSES — MANUFACTURES AND ARTS — DOMESTIC AND WARLIKE IMPLEMENTS — WAR.

When an Omawhaw dies, his kinsmen and friends assemble around his body, and bewail their loss with loud lamentation, weeping, and clapping of hands. Ong-pa-ton-ga, being once on a visit to St. Louis, observed a number of cattle gathering about a spot, where one of their kind had been recently slaughtered, smelling the blood, and pawing the earth; he said they behaved very like his own people, on the death of a relative.

They suffer the deceased to remain but a short time previously to interment, and often bear the body to the grave, before the warmth of vitality is entirely dissipated. The body is enveloped in a bison robe, or blanket, which is secured by a cord. It is then carried to the grave on the shoulders of two or three men, and followed by the greater portion of the mourners, without any order. The grave is an oblong square, of sufficient length, and four or five feet deep. The body is placed in the grave, and

with it a pair or two of mockasins, some meat for food, and many little articles and comforts, the gifts of affection, to be used on the long journey which the deceased is supposed to be about to perform, in order to arrive at the Wa-noch-a-te, or town of brave and generous spirits. The grave is then filled with earth, and a small tumulus is raised over it, proportioned in magnitude to the dignity of the deceased. The relatives bedaub their persons with white clay, scarify themselves with a flint, cut out pieces of their skin and flesh, pass arrows through their skin; and, if on a march, they walk barefoot at a distance from their people, in testimony of the sincerity of their mourning.

For a considerable time, they nightly visit the grave of the deceased, to lament over it. A sorrowing relative may be seen, of a bleak wintry night, bending over the grave, clad in a scanty robe, which scarcely conceals the middle of the back, as an additional self-punishment and unequivocal manifestation of grief.

For the death of a brave warrior, or of a chief, the lamentation is more general, and many of those who visit the body previous to its removal, present to it blankets, bison robes, breech-cloths, and mockasins, which are sometimes thus accumulated in considerable numbers; of these presents, part is retained by the orphans, if any, but the greater number is entombed with the body. Over the grave of a person of this description, a kind of roof or shelter is constructed, of pieces of wood reared against each other, and secured at top, then sodded over with grass sod.

The season prescribed by custom for mourning, is a period of from seven to twelve months; during this time the violent expressions of their grief gradually diminish, and towards the expiration of the allotted season, the state of mourning is only manifested by the coating of white clay, and even this, like the black apparel of civilized mourners, is at length

dispensed with, and with the same decorous gradation.

A cruel proof of heartfelt grief, is exhibited by some of the natives, on the upper parts of the Missouri; they cut off joints of their fingers; the individual cuts the skin and ligaments of the joint with his common eating knife, then places the joint between his teeth, and twists it off with violence, the teeth performing at the same time the offices of a wedge and a vice.

In form, the Missouri Indian is symmetrical and active, and in stature, equal, if not somewhat superior, to the ordinary European standard; tall men are numerous. The active occupations of war and hunting, together perhaps with the occasional privations, to which they are subjected, prevents that unsightly obesity, so often a concomitant of civilization, indolence, and serenity of mental temperament.

From this representation of the physical man, it is obvious that our observations do not correspond with those of Humboldt, regarding the natives of Canada, Florida, and New Spain, in as far as he represents them with the "squat body."

The forehead retires remarkably backward, and the posterior part of the head (occiput) has a flatness of appearance, attributable, perhaps, to the circumstance of its having rested so constantly during infancy, on the surface of a board, or on the scarcely less yielding interposed pad or pillow. Yet that organ, to which, in the phrenological system, the seat of amativeness is referred, although not usually very prominent, is still marked and distinct.

The facial angle of the cranium has been represented by Blumenbach at 73 degrees, an obliquity which induced him to place the American Indian in his series of the varieties of the human race, as the fourth in number.

But his observations were made upon the cranium of a Carib, than which people, as Humboldt justly

remarks, "there is no race on the globe in which the frontal bone is more depressed backwards, or which has a less projecting forehead." This observation will not rigidly apply to the western Indian, who certainly possesses a greater verticality of profile. Agreeably to the mensurations of Doctor Harlan, a cranium, which we obtained on the plains of the Platte, exhibits an angle of 78 degrees — A Wabash male 78°, female 80°, and a Cherokee only 75°.

The hair is coarse, black, glossy, and dense upon the head, sparse and slender upon the chin, independently of the custom of extirpating it, but although the hair is certainly oval in its transverse section, yet we could not perceive, that, in this respect, its proportions exceeded our own.

The line of the direction of their eyes is nearly rectilinearly transverse, being in this respect intermediate between the arcuated line of the eyes of the white man, and that of the Indians of New Spain, who, according to Humboldt, have the corner of the eye directed upward towards the temples.

The nose is generally prominent, and either aquiline or Roman, with the wings not more dilated than those of white men. This form of nose is so prevalent, as to be regarded as the most beautiful; it is no small compliment to tell a person that his nose is like that of a mule; and beauty is indicated in their language of signs, by placing an arcuated finger upon the face in imitation of the aquiline curve. The *pug-nose*, and the more common form of the noses of the white Americans, of a concave outline, are regarded as remote from the standard of beauty.

The lips are more tumid than those of the white American, but very far less so than those of the negro.

The lower jaw is large and robust; the teeth are very strong, with broad crowns. The chin is well formed.

The cheekbones are prominent, but not angular like those of the Mongul, and stamp a peculiarity on the contour of the face, characteristic of the American Indian.

The expression of the countenance is austere, often ferocious. [1]

Very few of them are left-handed, perhaps even a smaller number of them use the left hand in preference to the right, than is observable among white men.

The squaw differs from the males, in having a more squat figure, or is shorter and more thick bodied, with a much broader face.

The colour of the Indian is, according to Volney, that of the skin of smoked bacon ham. It is sufficiently obvious that this colour is independent of climate; those parts of the body, which are, and, agreeably to their representations, always have been, perfectly shielded from the action of the rays of the sun, from their youth upward, are, notwithstanding, of the same tint with the face, which is never covered.

In walking they preserve a perfectly upright carriage of the person, without any thing of the swinging gait so universal with the white people, which is regarded by them as excessively awkward, and which they imitate in their sports to excite the merriment of the spectators, though not in the presence of those whom they thus ridicule.

In stepping the feet are universally placed upon the ground in a parallel manner with each other; they say that turning out the toes in walking, as well as turning them inward, is a very disadvantageous mode of progressing, in high grass or in narrow pathways.

The peculiar odour diffused by the body of the Indian, seems to be caused, not so much by the cutaneous transpiration, as by the custom of rubbing themselves with odoriferous plants, and with bison

grease. They also sometimes make necklaces of a sort of sweet-scented grass, and suspend small parcels of it about their persons. The various kinds of pigments, with which they overspread their persons, may also be partially operative in producing this effect; and the ninnegahe, which they are so constantly habituated to smoke, is doubtless another agent.

The odour of the Indian is rather agreeable than otherwise to many, and that diffused by the persons of the Pawnee war party near the Konza village, increased by a profuse perspiration from the violence of their exercise in running, was rather pleasant to most of the members of our party. The Upsaroka or Crow Indians, are said to anoint themselves with castor.

To the acute sense of smelling of the Indian, the odour of the white man is far from pleasant, and is often particularly remarked by the squaw to be offensive.

Their sense of hearing is remarkably acute; ordinary conversation amongst the men, as we have before observed, is conducted in a low tone of voice; often when you suppose from the compass of the speaker's voice, that he is addressing a person at his elbow, he is, in reality, directing his discourse to one on the opposite side of the room, or at a considerable distance. The ordinary conversation of the women is in a much louder tone than that of the men. Partial deafness, however, is not uncommon.

The memory of the Omawhaw is exceedingly retentive.

The Omawhaw seldom renders himself unhappy with gloomy anticipations of the future, but almost literally takes "no care for the morrow." He will say to his squaw, "cook what meat you have, for the Wahconda will give us more to-morrow, and if not to-morrow, next day, and if never, let us eat what we have got."

They have but little mechanical ingenuity, but an individual of this nation, who is now no more, without acquiring any knowledge of the white people, as far as we could learn, mended the guns and traps of his countrymen, when not too seriously injured. But they have not attempted to repair either, since his death.

They rarely construct skin canoes; they make war-clubs, rude saddles, hair ropes, stone pipes, wooden bowls, horn spoons, and many personal ornaments.

The squaws make mockasins and leggings variously ornamented; and handsome necklaces, wrought with beads of different colours, which are symmetrically strung upon red silk, or thread coloured with vermillion. In the manufacture of this common, and much admired article of dress, ten double threads are attached by one end to a small *wang* or shred of leather, which is firmly stretched and fixed transversely to the work; each double thread is placed at such a distance from the adjoining ones, as to give room for the beads. These are then strung on, one upon each double thread; by this operation a transverse row of beads is formed upon the work, parallel to the *wang;* this being done, the left hand double thread is passed to the right, not over and under, but through all the other double threads, parallel to, and in contact with the row of beads, and in this position occupies the situation of woof or *filling;* but its extremity is continued along on the right side of the work, so as to resume, in that portion of its length, the character of warp or *chain.* Another row of beads is now put on; after which the next left hand double thread is passed through each of the others to the right of the work, as the previous one had been.

They also make handsome garters for supporting the leggings below the knee, of the breadth of the hand; they are formed of beads strung on worsted yarn.

Their art of painting is very rude, yet they manage to give some idea of a battle, by graphic representations in colour, on a bison robe. In the same manner are depicted the various animals, which are the objects of their hunts. These robes are also decorated with blue, red, and black broad lines, forming various designs; indeed it is very common to see a robe thus ornamented, worn by an Omawhaw.

The art of sculpture is also in its rudest state, and is almost limited to the ornamenting of the war-club with indented lines, forming different angular figures.

Their persons are often neatly tattooed in straight lines, and in angles on the breast, neck, and arms. The daughters of chiefs, and those of wealthy Indians, generally are denoted by a small round spot, tattooed on the forehead. The process of tattooing is performed by persons, who make it a business of profit. Their instrument consists of three or four needles, tied to the truncated and flattened end of a stick, in such an arrangement that the points may form a straight line; the figure desired is traced upon the skin, and some dissolved gunpowder, or pulverized charcoal, is pricked in with this instrument, agreeably to the figure. The operator must be well paid, and hence it is not every one that can conveniently sustain the expense of having this distinguishing mark placed on the forehead of his children.

Their astronomical knowledge is very limited. They distinguish the north star (Polaris), and are aware of its being apparently stationary, while the others seem to revolve. Venus is known by the name of *Me-ka-ka-tun-guh*, or big star. The constellation of the seven stars (Pleiades), is called *Tapa*, or deer's head. The constellation of the great bear (Ursa major), is distinguished by the term *Wa-ba-ha*, or car for transporting sick or wounded

persons on a march. The galaxy is called *Wah-conda-o-jun-ga*, or the path of the Master of Life. When the moon is eclipsed, they say *Me-om-bottsa*, or the moon is dead; and when the sun is eclipsed, they say the sun is dead. A comet they denominate *Me-ka-ka-nare*, or blazing star; this name, at least, was given to the comet of 1811; they regarded it as portending the death of some great chief; and as it happened, one of the great Pawnee chiefs did die the same year, which confirmed them in their notion. The three stars of Orion's belt, are called *Me-huh-se*, or the goose-foot.

Wangewaha, the Hard Heart, chief of the Ioways, has made himself considerably acquainted with the manners of the white people; he surprised Mr. Dougherty one day by inquiring, if it is true that the earth revolves round the sun; he was of course answered in the affirmative; when a sarcastic Indian of a group sitting near, was overheard to say in a low voice, that it was indeed a pretty story to tell them, when any person could see the sun rise there, pass along in that direction, and set there (pointing with his finger to the apparent course of the luminary).

The day is divided into morning, noon, evening, and night; and respectively indicated by the words, *Cas-aht-te*, *Me-o-kons-ka*, *Paz-za*, and *Hon-da*. Any particular hour of the day is denoted by pointing to the apparent place of the sun at the specified time. The years are denoted by the number of winters, and the months by lunations.

Their geographical knowledge of the country over which they roam is remarkably exact. They know intimately every river and creek in the vicinity of the Missouri, from Grand river up to the Arickaree nation, on the left side of the river, and as far down as the Osage river on the right, and south as far as the Black Hills, together with their courses and distances.

Mr. Dougherty, accompanied with two or three young Indians, arrived at an Omawhaw hunting encampment, late in the evening, and, after inquiring at several of the lodges, at length entered the one in which he intended to remain. Being asked by which way he had come, he pointed out, as he thought, the true direction; at this his fellow travellers smiled, and told him he was mistaken. He was not undeceived till he went out of the lodge to observe the direction they had indicated, when he became satisfied of their correctness. They had, however, been less frequently in that part of the country than he had been; but they had, without doubt, instinctively noted all the changes of the direction which they had made in winding through the temporary village, for they could not avail themselves of previous local knowledge.

But although they are remarkably accurate in their knowledge of the proper direction in which to travel, in order to reach a given point, yet they are often lost during foggy days, or during heavy snow storms.

Their culinary utensils are few in number, and simple in kind. The original earthenware pots are now rarely used by the nations on the lower part of the Missouri, being substituted by brass kettles, which they procure from the traders in exchange for their peltries. The Pawnees, however, whose intercourse with the whites has been less considerable than that of the nations bordering more closely on the Missouri, still employ earthen vessels, and yet continue the limited manufacture of them. These vessels are not glazed, and resemble in composition the antique fragments of Indian earthenware, found in various parts of the United States; the mementos of a numerous people, that have been destroyed by obscure causes, as well as by the avaricious policy, and cruelly unjust and barbarous encroachments of

a people, professing the mild doctrines of " peace on earth and good will to men."

Food is served up in wooden bowls, of a very wide and simple form, and of various sizes, generally carved, with much patient application, out of a large knot or protuberance of the side of a tree. The spoon is made of bison horn, and is of a large size; the handle, variously ornamented by notching and other rude carving, is elevated into an angle of fifty or sixty degrees with its bowl, which is about three inches wide, by about five in length; a size which, in civilised life, would be inadmissible.

The only implement of husbandry is the hoe; if they have not an iron one, they substitute the scapula of a bison, attached to a stick in such a manner as to present the same form. The traders supply them with axes of iron.

The weapons used in hunting are bows and arrows, and guns. The bow is about four feet long, of a simple form, composed of hickory, or hop-horn beam wood, (ostrya virginica,) or bow-wood, (maclura aurantiaca of Nuttall,) the latter being greatly preferred. The cord is of twisted bison, or elk sinew. The hunting arrow is generally made of arrow-wood, (viburnum,) about two feet in length, of the usual cylindric form, and armed with elongate-triangular spear-head, made of sheet iron, of which the shoulders are rounded, instead of the ordinary barbed form; it is firmly affixed to the shank by deer sinew, and its flight is equalised by three half webs of the feathers of a turkey, neatly secured near its base, in the usual manner. The war arrow differs from that used for hunting, in having a barbed spear-head, very slightly attached to the wood, so that if it penetrate the body of an enemy, it cannot be withdrawn without leaving the point in the wound.

The arrows are contained in a quiver, which is slung obliquely across the back, and which is generally made of Cougar skin, with the tail of the

animal dangling down from the upper extremity; attached to this quiver is also a skin case for the bow, when not in use. To bend the bow requires the exertion of considerable force, dexterously applied; for this purpose three fingers are placed upon the string, whilst the thumb and index finger grasp the base of the arrow, where it rests on the string; the wrist is defended from the percussion of the string by a guard of leather. The smooth bored gun is preferred to the rifle, the latter being too heavy for their use. Those called Mackinaw guns are greatly preferred to those which they more commonly procure from our traders, being far more substantial and serviceable.

They make use of no traps, excepting those for catching beaver, which they obtain from the traders chiefly on loan. The hooks which they use in fishing are bought of the traders. They have no fishing nets.

We saw no other domestic animals in the Indian villages than horses, mules, asses, and dogs. The first are by no means elegantly formed, but they are hardy and serviceable. The Indians are generally cruel horse masters, perhaps in a great measure through necessity; the backs of their horses are very often sore and ulcerated, from the friction of the rude saddle, which is fashioned after the Spanish manner, being elevated at the pummel and croup, and resting on skin saddle cloths without padding. They ride extremely well, and make great use of the whip and the heel. The former is attached to the wrist by a broad band, which passes through a hole perforated near the end of the handle. The handle is about fifteen inches long only, and very stout; that of the whip of Hashea, the Oto warrior, is the section of a gun-barrel. The lash is composed of two thongs of bison skin, from one-fourth to half an inch wide. These are alternately passed through small longitudinal slits cut in each, and, when

finished, exhibit, on a cursory view, the appearance of a flat plait, thick, and longer than the handle.

The dogs of the Konzas are generally of a mixed breed, between our dogs with pendant ears, and the native dogs, whose ears are universally erect; the Indians of this nation seek every opportunity to cross the breed. These mongrel dogs are less common with the Omawhaws; while the dogs of the Pawnees generally have preserved their original form.

No regular sentinels are appointed to watch during the night; but many of the young men, who are moving about the greater part of the night on their errands of love, often singing and hallooing to excite the attention of their mistresses, are the only guards of the safety of the village from surprise. If, however, the nation have reason to believe that the enemy is near at hand, or that there is a probability of an attack, they are necessarily vigilant; young warriors volunteer to look out at different points, or are requested to do so by the chiefs.

Wars generally originate in the stealing of horses, and the elopement of squaws; they are sometimes the consequence of infringing on each other's hunting grounds. Hostilities are generally conducted by small predatory parties, which are originated and formed under the influence of some approved warrior. An individual of this description, having determined to endeavour to assemble a war party, as a first step, paints himself over with white clay; he then passes through the camp or village, crying aloud to the Wahconda, and requesting the young warriors of the nation to have pity on him, and accompany him to strike at the enemy; he then ascends some hill or elevation, or repairs to the woods, and there continues for some time his ejaculations. The following day he gives a feast to all such as are willing to accompany him; and it is distinctly understood, that all of those who partake of his hospitality on this occasion are enlisted for the

excursion. He occasionally repeats this crying and feasting, until a convenient period can be assigned for their departure. During this interval he also occupies himself in *making medicine*, hanging out his medicine bags, &c. At his feasts he harangues his men, telling them that they must endeavour to make themselves known to the nation by their warlike deeds.

This leader the French distinguish by the name of *partizan*, and the Omawhaws *No-doh-hun-guh ;* his medicine parcel, upon which much reliance is placed, for the successful termination of their adventure, contains, almost always, the skin of a sparrow hawk (Falco sparverius), and many small articles, such as wampum, beads, and tobacco, all attached to a belt, but carefully and neatly enveloped in bark, and tied around by strips of the same material, forming a cylindrical figure, of about twelve inches in length.

This is suspended upon the back or shoulders of the partizan, by its belt, which passes round his neck.

Having their mockasins, leggings, guns, bows and arrows, spears, war clubs, and scalping knives prepared, each man furnishes himself with some provisions, and they all depart silently during the night, led by the partizan.

On their rout towards the enemy they proceed with great caution, and constantly send forward runners, or spies, to reconnoitre. When encamped, some individuals are vigilant during the night, but if they suppose themselves to be distant from the enemy, they keep no watch.

The medicine bag is not permitted to touch the ground ; accordingly on encamping, it is carefully suspended to a forked stick, which is stuck firmly in the soil ; the ceremony of smoking to it, is then performed, the stem of the pipe being occasionally directed towards it, the heavens and the earth. After this ceremony, if the party is in the vicinity of the

enemy, the partizan places the medicine bag about the neck of one of his trusty warriors, and, whispering in his ear, directs him to take two or three men, and look carefully about for signs of the enemy.

On the return of this messenger the partizan runs to meet him, receives his report in a whisper, takes the important charge from his neck, and whilst returning it to its place, communicates the intelligence he has received to his party; "no sign of the enemy has yet been discovered, but have patience, my brave young men, the Wahconda will soon have pity on us, and show us the enemy we so anxiously seek." If, on the contrary, the enemy is discovered, his position and numbers are reconnoitred, and the party prepares to attack them. The sacred medicine bag is now opened by the partizan; the envelop is rejected, and the remainder is suspended from his neck, with the bird skin, wampum, &c. hanging down before from the belt. This is a signal, indicating that a blow must be struck. The party then paint themselves, and smoke if time admits of it. The partizan at length gives the wished for order, and the whole move onward, with slow and cautious steps, in order to surprise the enemy; but if discovered, they rush on with impetuosity, and without any regular order. If the scene of the contest lies in the forest, they shield themselves behind trees of small diameter, when at the proper distance, from whence they discharge their missiles. If the attack is made in the open plain, where no shelter offers, they leap about from one side to another, and preserve a constant state of activity, for the purpose of preventing any steady aim from being taken at them by their adversaries.

It is not the mere shooting down of an enemy that confers great honour upon a warrior; this, the Indians say, can be done by any person, however cowardly he may be. But high distinction is due to the gallant soul, that advances upon the field of

battle, and captures an enemy, or who first strikes, or even touches the body of a fallen enemy, in presence of the friends of the deceased, who are generally watching their opportunity to revenge his death.

This is, indeed, an extraordinary proof of courage, as the act is not to be accomplished without the greatest hazard of life; the adventurer is obliged to expose himself, often, to a great number of assailants, besides the danger of falling into an ambush, in attempting to strike the decoy. It is this *striking*, that is numbered amongst their war feats by the warriors, at their dances.

The capture of a prisoner confers the highest honour on the captor. Striking an enemy, whilst active, appears to be the second in rank, of their great martial achievements. Striking his dead, or disabled body, confers the third honour. Capturing a horse may be regarded as the fourth; presenting a horse to any person, the fifth, and the shooting, or otherwise killing an enemy, by a missile, is the sixth in point of rank of military deeds, in the estimation of the Omawhaws. The taking of a scalp is merely an evidence of what has been done, and, of itself, seems to confer no honour.

The prisoners are well guarded, and not roughly treated, unless a strong party of the enemy are in pursuit, when they are put to death.

On the battle ground, the wounded of the vanquished are killed, and their dead are cut and hacked by the victors; but if it should chance to be accessible to the squaws, they perform the chief part in this tragedy. They sever the limbs from the bodies, and attaching them to strings, drag them about with vociferous exultation: etiam genitalia excidunt, and tying them about the necks of their dogs, they drive them before them, with much shouting, laughter, noise, and obscene expressions.

A war party, after having struck a blow upon the enemy, return with rapidity towards their village.

They leave the mutilated carcases of the slain upon the contested field, a prey to the wolves and vultures. Their own dead are covered with wood or stones, and their wounded are transported on litters, on the shoulders of others, or if they have horses with them, upon cars of a very simple construction. Two poles are attached to the neck of the horse, in the manner of shafts, which trail upon the ground behind. These are so connected behind the horse, with cross pieces lashed on, that a bison robe can be suspended to them, for the reception of the wounded person.

If the attack is made during the night, or if the party has only captured horses unobserved by the enemy, a mockasin or arrow is left in a conspicuous situation, to inform the enemy of the nation to which the aggressors belong.

Large war parties sometimes divide into smaller parties, in order to attack simultaneously at different points. Each of these parties on its return, at its different encampments, inserts small painted sticks in the soil, pointing to the route they have taken. They also peel off a portion of the bark from a tree, and on the trunk thus denuded and rendered conspicuous, they delineate hieroglyphics with vermillion or charcoal, indicative of the success or misfortune of the party in their proceedings against the enemy. These hieroglyphics are rudely drawn, but are sufficiently significant, to convey the requisite intelligence to another division of the party that may succeed them. On this rude chart, the combatants are generally represented by small straight lines, each surmounted by a head-like termination, and are readily distinguishable from each other; the arms and legs are also represented, when necessary to record the performance of some particular act, or to exhibit a wound. Wounds are indicated by the representation of the

dropping of blood from the part; an arrow wound, by adding a line for the arrow, from which the Indian is able, to estimate with some accuracy, its direction, and the depth to which it entered. The killed are represented by prostrate lines; equestrians are also particularized, and if wounded or killed, they are seen to spout blood, or to be in the act of falling from their horses. Prisoners are denoted by their being led, and the number of captured horses is made known by the number of lunules, representing their track. The number of guns taken may be ascertained by bent lines, on the angle of which is something like the prominences of the lock. Women are portrayed with short petticoats and prominent breasts, and unmarried females by the short queues at the ears, before described.

A war party, on its return, generally halts upon some elevated ground within sight of the village; and if they have been successful, they sit down and smoke their pipes. The villagers on discovering them rush out to meet them, and receive a brief relation of the events that have occurred during the expedition.

All then return to the village, exhibiting by the way the greatest demonstrations of joy, by discharging their guns, singing war-songs, &c. The scalps stretched upon hoops, and dried, are carried upon rods of five or six feet in length.

Arrived at the village, some of the squaws, wives to the warriors of the party, assume the dress of their husbands, and, with the rods bearing the scalps in their hands, dance around a large post, reddened with vermillion, and, in concert with the young warriors, sing the war and scalp songs; the young warriors occasionally step into the ring of the dancers, and all keep time, with dance and song, to the loud beat of the gong. Into this dance are also admitted the relatives of the war party.

This barbarous dance appears to delight them,

and particularly the squaws, who are the principal actors, more than almost any other of their enjoyments.

Indeed, it is to the squaws that many of these exertions are attributable, as those whose husbands have not been successful in war, frequently murmur, saying, " You have had me for a wife a long time, and have never yet gratified me with the scalp dance."

Those squaws, whose husbands or relatives have been killed during the excursions of the party, take no part in this blissful dance, but rub themselves with clay, and lament.

This dance is repeated every night for two or three weeks, after which it is renewed occasionally for a twelvemonth. The scalps are often cut into slips, that many of the dancers may be accommodated with them; but this was never done with an intention to deceive, respecting the actual number of the enemy killed. After the termination of this ceremony, the scalps are either thrown away, or are used to decorate the leggings of the warrior, or to suspend from his medicine-bag, or from the bridle of his horse.

Soon after the return of the party, the principal warriors are invited to feasts by different villagers, where they recount the events that have transpired during their absence. They narrate the mode of approaching the enemy, the onset, the battle, all the little particulars of which are detailed; but they seem to dwell with particular pleasure on the conduct of individuals of the enemy, as it appeared immediately before they received the death blow; if there was any movement of the body, or emotion exhibited upon the countenance of the victim, that betrayed a want of firmness, or fear of death, at that awful juncture, the account excites much laughter in the audience. If the disabled individual was so imbecile as to shrink from a blow of the tomahawk

or war-club, he is ridiculed as a coward. If he is said to have cried for quarters, or begged for mercy, or to have held up the palm of his hand towards the victor to appease his vengeance, the account is received with ridicule and laughter, at the expense of the deceased. If, on the contrary, he is said to have perished with that stoicism and contempt of death, which is regarded as worthy of the Indian warrior, the auditors, although they may smile with pleasure at the death of an enemy, yet pay due honour to his manes, saying he was a brave fellow; and they do not fail to applaud the bravery of his victor also.

All those of the party who have first struck a body, or taken a prisoner, paint themselves black, and if any strangers are in the village, they put on their *crow*, and appear before them, or near them, and sing their war-song in which their exploits are detailed.

The prisoners are differently treated according to their sex, age, and qualifications. Of the squaws they make slaves, or rather servants, though these are sometimes advantageously married. To the young men the task of tending horses is commonly assigned; but the children are generally adopted into their families, and are treated in every respect as their own offspring; when arrived at maturity they are identified with the nation, and it would be an insult to apply the name of their own countrymen to them.

CHAPTER II.

WAR — NEGOCIATION FOR PEACE — REVENGE — SELF-ESTEEM — HOSPITALITY — MIMICRY.

An individual warrior not unfrequently goes to war unaccompanied; but parties are generally made up for this purpose, in the manner before mentioned. In cases of extraordinary provocation, the whole nation of warriors marches in a body to attack the enemy, under the direction of the principal chief.

More than twenty years ago, the Omawhaws marched against the Pawnee Mahas or Pawnee Loups. They encountered them on their hunting grounds, between the Platte and Quicourre rivers, in the prairie, where they attacked them, killed sixty, and wounded a great many; after securing a number of prisoners, and many horses, they returned with their booty, having lost but fifteen warriors. Peace was soon after concluded between the two nations, which has not been since violated, excepting on one occasion, when their dispute was bloodless, and but of short duration.

Sometime after this event, Mot-tschu-jinga, or the Little Grizzly Bear, a brave and distinguished warrior of the nation, with two or three attendants, visited the village of the Pawnee republicans, in order to perform the calumet dance before the people. This was a band with whom they were barely at peace. The republicans seized him, flogged him, cut off his hair, broke his pipe, forced him to drink urine mixed with bison gall, and drove him from the village without food. These extraordinary and most humiliating indignities aroused within him the fiercest spirit of vengeance. He returned, and related his misfortune

to his people, who, penetrated with indignation, promptly assembled in arms, and led by the great Washingguhsahba, or Black Bird, marched to revenge such unheard-of indignity. When within a short distance of the devoted village, they placed their squaws in a secure situation, under a proper guard, and proceeded to the attack. They urged the contest so fiercely that the enemy was driven from lodge to lodge, until four lodges only were left to them, in which they succeeded in defending themselves; the town, with the exception only of the four lodges, was then burned to the ground, and the victors retired after destroying nearly one hundred of the enemy, and wounding a great number, with the loss to themselves of only fifteen warriors.

Under the same great leader, the nation, on another occasion, attacked the Puncaws; this act was induced by the practice of the latter of stealing squaws and horses from the Omawhaws. The Puncaws, for the purpose of defending themselves against the fire of the enemy, threw up an earthen embankment; but finding, notwithstanding the protection it afforded them, that their numbers rapidly diminished under the galling fire opposed to them, they determined to sue for peace; for this purpose two pipe-bearers were sent out successively towards the enemy, but they were both shot down. A chief then dressed up his handsome daughter, and sent her forth with a pipe to the Omawhaws. This mission was respected, the stern victors were vanquished by beauty, the proffered pipe was accepted, and unhesitatingly smoked, and a peace was concluded, which has not since been infracted by the Omawhaws. Soon after the death of Washingguhsahba, his successor Mushchinga, the Big Rabbit, led the nation against the Otoes, whom they attacked in their village. It was the intention of the assailants to burn the village, and exterminate the nation. With this view they provided themselves with dry grass, which was twisted into the form of thick ropes,

and secured to their girdles. When within the proper distance they despatched a detachment to take ambush on the opposite side of the village, then kindled a fire, at which they lighted the grass torches, and rushing into the village, succeeded in setting many of the lodges on fire, by fixing the torches to them. Such was the fury of the unexpected attack, that the Oto warriors were driven from the village, but falling into the ambuscade, they fought their way back to their lodges with much slaughter. A heavy fall of rain now commenced, which rescued the remaining Otoes from entire destruction. The conflagration was quickly extinguished, the guns and bow-strings of the invaders became useless, and the Otoes sallying out with fresh weapons, forced them to a precipitate retreat. The loss was severe on both sides, but the Omawhaws succeeded in carrying off almost all the horses of the enemy, besides a number of prisoners, furniture, &c. The war continued between these two nations until the pacification which was accomplished through the agency of Lewis and Clark, and has continued to the present day.

Reverting to the period of the government of Washingguhsahba, we are informed that the Padoucas once approached the nation, and stole a number of horses, when this chief assembled his warriors, and pursued them; observing the tracks of their feet in the soft earth, he discharged his gun repeatedly into them, declaring that thereby he would cripple the fugitives so entirely, that it would be easy to overtake and destroy them. Accordingly he did overtake them, and, agreeably to the Indian account, they were unable to defend themselves, and were all destroyed but two or three, who escaped, and failed not to inform their people of the wonderful medicine of the victor.

The last martial expedition of Washingguhsahba, terminated disastrously for his nation. He led his warriors against the Konzas, halted them near the

village of that people, and singly rode round the village, repeatedly discharging his gun at the inhabitants, as he passed swiftly by them. As soon as the Konza warriors were collected, they sallied out in pursuit of the Black Bird, who had now joined his party. The parties closed, and intermingled in fight, and the contest was obstinate and protracted. An Omawhaw pierced the thigh of a Konza with an arrow; the latter called aloud to inquire the name of his adversary, and was answered, No-zun-doj-je (he who does not dodge). "My name," said the Konza, "is ——— (he who kills brave men), so come on, we are happily met." They approached each other, leaping laterally and capering, the Omawhaw discharging his arrows, and the Konza endeavouring to get aim with his fusee; the latter at length succeeded, and shot his opponent.

The conflict at length became too warm for the Omawhaws, who retreated eight miles, disputing the ground, however, the whole distance. They now arrived at the prairie, on which we encamped on the evening of the 24th of August last.

Here the Omawhaws again made a stand, and fought the principal battle, but were overpowered, and obliged to fly, leaving their numerous killed and wounded to the vengeance of the enemy.

These two nations still continue hostile to each other.

It is said that during the youth of Washingguhsahba, he was taken prisoner by the Sioux. That the town of the Omawhaws, was then on the opposite bank of the Missouri, at the mouth of the stream called by Lewis and Clark, Floyd's river, and that the nation had not, at that time, been long resident there.

Some time previous to the variolous mortality in the Omawhaw nation, several bands of Sioux, in conjunction with the Shienne nation, attacked them on their return from a summer hunt, and overpowered them by numbers.

A few years since, the Pawnees made a general attack upon the Konza village. They were all mounted on horseback, and rode furiously about, whilst they fired into the Konza lodges. The principal chief of the nation, Burning Heart, ran through his village, calling out to his warriors to remain quietly in their houses for the present, and not show themselves to the enemy, or return their fire, in order to give them time to tire out their horses by continued action. After a while a few shots were returned, to prevent the Pawnees from rushing into the town itself, and when the horses appeared to be sufficiently fatigued, Burning Heart despatched two strong parties from the opposite end of the village from that upon which the attack was made, one of which, moving rapidly upon their hands and knees, gained a ravine, along which they ran until they gained the enemy's rear: they were here joined by the other party, which had gained the same situation by means of a lower prairie, along the bank of which they passed unperceived. Finding themselves thus out-generaled, the Pawnees were under the necessity of charging through the enemy, and flying with jaded horses before them. So rapid was the pursuit, that the Pawnees were obliged to precipitate themselves into the ravines, over which they must pass, to the destruction of many of their horses. Finally, they made their escape, with the loss of eighty men, and the greater part of their horses.

When a hunting party is suddenly attacked by an enemy, the squaws, whilst their husbands are engaged in opposing the enemy, sedulously occupy themselves in digging basin-shaped pits with their hoes, for their personal security, and stooping down in them, escape the missiles of the contending parties; their husbands, if too hard pressed, also retreat to these cavities, from which they can continue the action with very little exposure of their own persons, whilst the enemy possesses no shelter.

Besides the national battles, in which great waste of life occurs, small war parties, or such as have been already described, are almost constantly in motion, and are also destructive.

The Serpent's Head, a distinguished Oto warrior, assembled a war party of thirty men, and moved against the Konzas. Within a few miles of their village, at a narrow defile on Blue-earth Creek, he placed his party in ambush, and with two or three selected men, he advanced to within a hundred yards of the village. At the dawn of day a Konza, having occasion to walk a short distance, was attacked by the Serpent's Head singly, who buried his tomahawk in his head, and took off his scalp, within view of many of the villagers. These seized their weapons, and immediately pursued the fugitives, until they reached the pass, where, falling into the ambuscade prepared for their reception, they lost seven of their number, and were obliged to retreat precipitately, to seek the protection of the main body of their warriors, who, they supposed, were now in pursuit, and at no great distance in the rear.

The Otoes, after striking and scalping the slain, proceeded on their way home, at a very moderate pace, not caring to elude the powerful force, which they well knew must be hard by. The Konza warriors, dashing on at full speed, at length discovered the retreating band, moving at their leisure over a prairie, and immediately attacked them. The Otoes withstood the shock of the overwhelming force for some time, until, losing a number of their party, they were under the necessity of seeking safety in flight.

An Oto hunting party, consisting of five lodges, was encamped in the vicinity of the Konza hunting grounds; two or three of their number, who were at a distance from their companions, encountered a young Konza warrior, who deliberately approached

them, and when sufficiently near discharged his gun at them, but was immediately shot down.

The Otoes suspecting, from some appearances, the proximity of a large body of the enemy, precipitately returned to their party, and hastened to place themselves in an attitude of defence. They availed themselves of three large logs, which had fallen so as to form a triangular area, into which they removed their effects, and strengthened the defences in such a manner as to afford them some security.

The squaws dug cavities in the earth for themselves, and their children, as an additional security.

Scarcely were these preparations finished, when the whole body of the Konza warriors made their appearance, and commenced the attack on this little body of fifteen Otoes. These gallant fellows, thus advantageously posted, notwithstanding the fearful odds opposed to them, returned the fire of the enemy promptly, and at length succeeded in repulsing them, with the loss of two or three of their own men, and after having killed about fifteen of the Konzas.

The following trait in the character of a distinguished warrior is worthy of being recorded. During the residence of the Pawnees on the Platte at the cedar hills, about fifteen or eighteen years since, the Otoes were frequently at war with them, notwithstanding their own great numerical inferiority. On one occasion, during a pacific interval, some Otoes followed the Pawnees, who had just left their village on a national hunt, and stole two horses from them. This outrage, committed in time of peace, highly incensed Wasacaruja: "If you wish for war," said he to the offenders, as he mounted his horse, "you shall have it." He rode immediately, in his anger, to the deserted Pawnee village, and setting fire to the lodges, burned them all to the ground.

On their return, the Pawnees, finding their village destroyed, they marched in a body to the Otoes,

and demanded satisfaction for the injury they had received. Wasacaruja, perhaps, penitent for his rash act, and no doubt now wishing to avert the hostilities which he had incited, advanced to them at once, saying "I am the person who burned your town, kill me if you will." This however the Pawnees declined, and were at length reconciled to their loss, by presents of horses and merchandize. They then removed from the vicinity of the Otoes, and erected their present village on the Loup fork of the Platte.

The Otoes, as well as the Konza warriors, will not, on any consideration, sit down whilst on a war excursion, until evening; they will lie down, and stoop down, but they must not rest upon the ground in a sitting posture.

An Upsaroka, or Crow, war party, who were hovering about the Rickaree village, waiting an opportunity to strike a blow, observed a boy entirely alone, and at a distance from any succour; having a boy belonging to the party much of the same size, they permitted him to attack the Rickaree boy singly; the assailant was successful, and brought off the scalp of the enemy.

One of the warriors then took the scalp, and rode with it near to the village in defiance.

During the last seven or eight years, since they have become influenced by the agents of the United States, the Omawhaws have entirely abstained from carrying the war into the country of their enemies; no unprovoked parties have been sent out, and the nation, agreeably to the injunctions of the agents, restricts its military operations solely to defensive warfare. Partial attacks have been made upon them during this time, which have always been promptly repelled, sometimes with considerable slaughter.

That implicit confidence may be justly reposed upon, at least, some of this people, the following anecdote will testify.

In the year 1815 the Ioways came to the mouth of the Platte river, and found there a trader engaged in trafficking with the Otoes. They attempted to take possession of his merchandize by force, but were opposed and repelled by the Otoes, who determined to protect their trader. The Ioways, however, threatened the trader to plunder him as soon as the Otoes should depart, whose provisions being now nearly exhausted, the fears of the trader for his safety became more excited, in proportion as the time of their departure approached. He despatched a boy with a letter to his partner, Mr. Lisa, then trading at Council Bluff, a distance of thirty miles, informing him of his situation, and of the fact, which had but then come to his knowledge, that the Ioways had formed a small party for the purpose of visiting Council Bluff, and committing some depredations there.

On the reception of this intelligence, Mr. Lisa sent a favourite Omawhaw, Wa-co-ra, to accompany the boy with his reply.

In the meantime the Ioway party had set out, and after travelling a considerable distance, the partizan became lame, and was left with a companion on the way.

Wacora, fortunately, did not meet the party, but he saw the partizan with his companion, calmly seated in fancied security, amongst the thick bushes. He crept silently near to them, who were distinctly recognized by the boy, and discharging his gun, broke the arm of the partizan's companion.

The partizan immediately perceiving the aggressor to be an Omawhaw, exclaimed, " I am a half Omawhaw ; I was going to war against the Long-knives, not against the Omawhaws ; shoot no more, you have wounded one of us." Wacora answered, " I am a Long-knife," upon which the wounded man made a charge with a lance, and had nearly transfixed the boy, when Wacora shot him ; he

afterwards killed the partizan, and bore off their scalps. Finding now the trail of the party, which he readily ascertained by their tracks, to consist of nine persons, he determined to return immediately with his utmost speed, even at the risk of meeting with the party, in order to inform Mr. Lisa of their presence in his vicinity; this he accomplished at the imminent hazard of his life. Thus proving that the most unlimited confidence might be safely reposed in his faithful performance of his trusts.

Warriors often venture singly into the vicinity of an enemy's village, and even into the village itself, to capture horses or kill one of the nation. The Borgne, or One Eye, Ka-ko-a-kis, late grand chief of the Minnetarees, entered the village of an enemy at night, with his robe covering his head for concealment. He passed into several lodges, until at length he found one tenanted, at the moment, only by a young squaw; he drew his knife, compelled her to submit to his desires, then stabbed her to the heart, and bore off her scalp. He was a chief possessed of much power, but was almost universally disliked as a very bad man, and was at length killed by the Red-shield chief, E-tam-ina-geh-iss-sha.

The warriors often meet together and narrate, emulously, their war exploits; two of them were one day thus engaged, one of whom, Wa-ke-da, or the Shooter, had killed more enemies than any other individual of his nation, although he had never *struck* more than two or three bodies of the slain. They continued for some time to boast of their feats, when the father of Wakeda, an old man of seventy years, in order to terminate the altercation, leaped from his seat, and, after *striking* upon several nations, concluded by the following witticism: "I approached the Pawnee-mahaws alone, for the purpose of stealing horses. I entered their village in the evening, succeeded in getting into one of their stalls, and was proceeding to take out the horses, when I was sur-

rounded and made prisoner. They flogged me, thrust a stick into my anus, and sent me off, with the stick depending like a tail." This, as was intended, terminated the boasting, and the parties joined in general good humour.

Their notions of the attributes of bravery differ in many respects from those which we entertain of them. It is, in their estimation, no proof either of valour or good sense, for a warrior to advance into the plain, stand still, and suffer his enemy to take deliberate aim, in order to shoot him down, when such a course of conduct can be avoided; but they say that when a warrior goes to battle, it is a duty, which is due to himself, to his nation, and to his friends, to avail himself of every possible advantage over his enemy, and even to kill him, if he can, without any risk of his own person. But a warrior must never yield in battle; he must contend until death, if he cannot escape from his enemy. And if entirely surrounded, he rushes amongst them, and endeavours to destroy or injure as many as possible, and in death he exhibits traits of passive courage, which form no part of the character of civilized men.

The succeeding narrative may serve, better than any general remarks, to convey an idea of the formalities attendant on a negociation for peace, amongst the Missouri Indians.

During the stay of our detached party at the Konza village, several chief men of the nation requested Mr. Dougherty to lead a pacific deputation from their nation, to their enemies the Otoes, Missouries, and Ioways, then dwelling in one village on the Platte. Circumstances then prevented the gratification of their wishes, but he gave them to understand, that if the deputation would meet our party near Council Bluff, he would probably then be authorized to bear them company; on which they determined to send a party thither. Accordingly, on

the day preceding the arrival of our steam-boat at the position chosen for our winter cantonment, a deputation from the Konzas arrived for that purpose. It consisted of six men, led by He-roch-che, or the Real War Eagle, one of the principal warriors of the Konza nation.

Mr. Dougherty having made their pacific mission known to Major O'Fallon, the latter expressed to them his cordial approbation of their intentions, and the following day he despatched Mr. Dougherty with them, to protect them by his presence, on their approach to the enemy, and to assist them by his mediation, in their negociations, should it be found necessary.

They had not proceeded far on the way, when one of the Indians inquired if the Sioux war parties were often in the neighbourhood. Mr. Dougherty informed them that they were; that they had killed an Oto some time since, and more recently, four Omawhaw squaws. This intelligence induced Herochshe to request the loan of Mr. Dougherty's gun; they all looked sharply about them, and requested their guide to take the lead.

The distance to the Oto village is about twenty-five miles; on the journey over the prairies, they espied an object at a distance, which was mistaken for a man, standing upon an eminence. The Indians immediately halted, when Herochshe addressed them, with the assurance that they must put their trust in the Master of life, and in their leader; and observed, that, having journeyed thus far on their business, they must not return until their purpose was accomplished; that if it was their lot to die, no event could save them; "We have set out my braves *," said he, "to eat of the Otoes' victuals, and we must do so or die;" the party then pro-

* When on a war excursion, or a pacific mission, the Indians always address their companions in this manner: "My companion, my brave. My brother, my brave."

ceeded onward. The Indians are always very cautious when approaching an enemy's village, on any occasion, and this party well knew that their enterprize was full of danger.

In a short time they were again brought to a halt, by the appearance of a considerable number of men and horses, that were advancing towards them. After some consultation and reconnoitring, they sat down upon the ground, and lighting the peace-pipe, or calumet, Herochshe directed the stem of it towards the objects of their suspicion, saying, "smoke friend or foe;" he then directed it towards the Oto village, towards the white people, towards heaven, and the earth, successively.

The strangers, however, proved to be drovers, with cattle for the troops, on their way to Council Bluff.

In consequence of being thus detained, it was late in the afternoon when the party arrived at the Platte river, and as they had still eight miles to travel, and it was indispensable to their safety that they should reach the village before dark, Mr. Dougherty urged his horse rapidly forwards. The Indians, who were all on foot, ran the whole distance, halting but twice, in order to cross the Elk Horn and Platte rivers, although one of them was upwards of sixty years of age, and three of the others were much advanced in years.

As they drew near the Oto village, they were discovered by some boys, who were collecting their horses together for the night, and who, in a telegraphic manner, communicated intelligence of their approach, to the people of the village, by throwing their robes into the air.

The party was soon surrounded by the inhabitants, who rushed towards them, riding and running with the greatest impetuosity. The greatest confusion reigned for some time, the Otoes shouting, hallooing, and screaming, whilst their Konza visitors lamented aloud. Shaumonekusse soon arrived, and restored a

degree of order, when, the business of the mission being made known in a few words, the Konzas were taken up behind some of the horsemen, and conveyed as rapidly as possible to the lodge of Shongotongo, lest personal violence should be offered them on the way. They did not, however, escape the audible maledictions of the squaws as they passed, but were stigmatized as wrinkled-faced old men, with hairy chins, &c., ugly faces, and flat noses.

After running this species of gauntlet, they were quietly seated in the lodge, where they were sure of protection. A squaw, however, whose husband had been recently killed by the Konzas, rushed into the lodge, with the intention of seeking vengeance by killing one of the ambassadors on the spot. She stood suddenly before Herochshe, and seemed a very demon of fury. She caught his eye, and at the instant, with all her strength, she aimed a blow at his breast with a large knife, which was firmly grasped in her right hand, and which she seemed confident of sheathing in his heart. At that truly hopeless moment, the countenance of the warrior remained unchanged, and even exhibited no emotion whatever; and when the knife approached its destination, with the swiftness of lightening, his eyes stood firm, nor were its lids seen to quiver; so far from recoiling, or raising his arm to avert the blow, that he even rather protruded his breast, to meet that death which seemed inevitable, and which was only averted by the sudden interposition of the arm of one of her nation, that received the weapon to its very bone.

Thus foiled in her attempt, the squaw was gently led out of the lodge, and no one offered her violence, or even harsh reproof. No further notice was taken of this transaction by either party.

Food was then, as usual, placed before the strangers, and soon after a warrior entered with a pipe, which he held whilst Herochshe smoked, saying in a loud voice, "you tell us that you wish for peace, I say, I

will give you a horse, let us see which will be the liar, you or I." The horse was presented to him.

The evening, and much of the night was passed in friendly conversation respecting the events of the five years' war which they had waged with each other.

On the following morning the Konzas were called to partake of the hospitality of different lodges, whilst the principal men of the village were assembled in council, to deliberate upon the subject of concluding a peace.

At noon the joint and grand council was held in the Crenier's lodge. The Otoes, Missouries, and Ioways took their seats around the apartment, with the Konzas in the centre. Herochshe, whose business it was first to speak, holding the bowl of the calumet in his hand, remained immovable for the space of three-fourths of an hour, when he arose, pointed the stem of the calumet towards each of the three nations successively, then towards heaven, and the earth, after which he stretched out his arm, with the palm of the hand towards the members of the council, moving round with his body so as to present the palm towards each of the members in succession. He then proceeded to shake each individual by the hand, after which he returned to his place, and renewed the motion of the hand as before.

Having performed all these introductory formalities, he stood firm and erect, though perfectly easy and unconstrained, and with a bold expression of countenance, loud voice, and emphatical gesticulation, he thus addressed the council.

" Fathers, brothers, chiefs, warriors, and brave men. You are all great men. I am a poor obscure individual. It has, however, become my duty to inform you, that the chiefs and warriors of my nation, sometime ago, held a council for the purpose of concerting measures, to terminate amicably, the cruel and unwelcome war, that has so long existed between us, and chose me, all insignificant as I am, to

bring to you this pipe which I hold in my hand. I have visited your village, that we might all smoke from the same pipe, and eat from the same bowl, with the same spoon, in token of our future union in friendship.

" On approaching your village, my friends and relatives, I thought I had not long to live. I expected that you would kill me, and these poor men who have followed me. But I received encouragement from the reflection, that if it should be my fate to die to-day, I would not have to die to-morrow, and I relied firmly upon the Master of life.

" Nor was this anticipation of death unwarranted by precedent. You may recollect that five winters ago, six warriors of my nation came to you, as I have now done, and that you killed them all, but one, who had the good fortune to escape. This circumstance was vivid in my memory when I yesterday viewed your village in the distance; said I, those warriors who preceded me in the attempt to accomplish this desirable object, although they were greater and more brave than I, yet were they killed by those whom they came to conciliate, and why shall not I share their fate; if so, my bones will bleach near theirs. If, on the contrary, I should escape death, I will visit the bones of my friends, The oldest of my followers here, was father-in-law to the chief of those slaughtered messengers; he is poor and infirm, and has followed me with difficulty; his relatives, also, are poor, and have been long lamenting the loss of the chief you killed. I hope you will have pity on him, and give him a pair of mockasins (meaning a horse) to return home with, for he cannot walk. Two or three others of my companions are also in want of mockasins for their journey homeward.

" My friends! we wish for peace, and we are tired of war; there is a large tract of country, intervening between us, from which, as it is so constantly

traversed by our respective hostile parties, we cannot either of us kill the game in security, to furnish our traders with peltries. I wish to see a large level road over that country, connecting our villages together, near which no one can conceal himself in order to kill passengers, and that our squaws may be enabled to visit from village to village in safety, and not be urged by fear, to cast off their packs, and betake themselves to the thickets, when they see any person on the route. Our nations have made peace frequently, but a peace has not hitherto been of long duration. I hope, however, that which we shall now establish will contine one day, two days, three days, four days, five days. My friends! what I have told you is true; I was not sent here to tell you lies. That is all I have to say."

Herochshe then lit his pipe, and presented the stem to the brother of the Crenier, Wa-sac-a-ru-ja, or He who eats raw, who had formerly been his intimate friend. The latter held the end of the stem in his hand, whilst he looked Herochshe full in the face, for a considerable space of time. At length he most emphatically asked, "Is all true that you have spoken." The other, striking himself repeatedly and forcibly upon the breast, answered with a loud voice, "Yes! It is all truth that I have spoken." Wasacaruja, without any further hesitation, accepted the proffered pipe, and smoked, whilst Herochshe courteously held the bowl of it in his hand; the latter warrior then held it in succession to each member of the council, who respectively took a whiff or two, after which the pipe itself was prepresented to Wasacaruja to retain.

It is impossible to convey an adequate idea of the energy, and propriety, with which this speech was delivered, or of the dignity and self-possession of the speaker, Before he commenced, he hesitated and looked around upon his enemies, probably in order to trace in the lineaments of their countenances, the

expression of their feelings towards him. He then began his address, by raising his voice at once to its full intonation, producing a truly powerful effect upon the ear, by a contrast with the deep and long continued silence which preceded it. He was at no loss for subject or for words, but proceeded right onwards to the close of his speech, like a full-flowing, bold, and impetuous stream.

Wasacaruja, in consequence of having first accepted of the calumet, was now regarded as responsible for the sincerity of his friend Herochshe. He therefore arose, and thus addressed the ambassador. "My friend! I am glad to see you on such an occasion as the present, and to hear that your voice is for peace. But I can hardly believe that we can ever rest in a permanent peace. A few winters ago, when we were in friendship with each other, I visited your village, and you gave me all your people, saying, that all the Konzas were mine. But it was not long afterwards, as we hunted near your country, that you stole our horses and killed some of our people, and I cannot but believe that the same course will be again pursued. Nevertheless, I shall again repair to the same place, of which I have spoken, this autumn, for the purpose of hunting, and in the spring I will again visit your town. You observed that you were apprehensive of being killed as you approached our village; and you most probably would have been so, coming as you did, late in the evening, and without the usual formality of sending a messenger to apprize us of your approach, had you not been accompanied by the Big-knife with whom you are so well acquainted. But we have now smoked together, and I hope that the peace thus established, may long continue. You say that you are in want of mockasins, we will endeavour to give you one or two for your journey home. That is all I have to say."

Herochshe then apologized for his unceremonious

entrance into the village, by saying that he knew it to be customary, to send forward a runner on such an occasion, and he should have done so, but his friend, the Big-knife, whom he had previously consulted with that view, told him, that he had full confidence in the magnanimity of the Otoes.

Thus the ceremony was concluded, and peace restored between the two nations.

Numerous are the anecdotes already related by various authors, which go to show, that the desire of revenge for an injury or insult is remarkably permanent with the North American Indian. It would almost seem, that neither time nor circumstance can utterly eradicate it, and it is certain that it is not always extinguished with the life of the offended individual, but that it sometimes descends as an inheritance to his posterity.

A Puncaw warrior was killed in a quarrel, over the carcass of a bison, by a noted desperado of his own nation. The deceased left two sons, the elder of whom, in the course of a few years, became of sufficient age to hunt, and had the good fortune, in his first essay, to kill a fine bison. Whilst he was occupied in taking off the skin from his prey, he espied the murderer of his father approaching, who took his stand near the young hunter, and regarded him with a stern aspect. "Look up," said the intruder; the young man proceeded with his occupation. "I say, look at me;" reiterated the other, "do you know who I am? begone from this carcass, it is mine." The young hunter then raised his eyes to the countenance of him, whom he had long been taught to consider as his enemy, and fiercely retorted the dark malignant scowl which was concentrated there; then gathering his bow and arrows, he slowly retired a short distance, and turning, perceived that the warrior had already taken possession of his prize. "Yes," he exclaimed, bending his bow, "I do know you well; you are the murderer of *my*

father, and are the cause of my being an orphan." As he spoke, he discharged an arrow, which pierced the heart of his enemy, who fell dead; the victor, however, continued to feather his body with arrows, until his quiver was exhausted. He then returned to the village and related his story to the people, who rejoiced at the death of a common disturber of the peace, and no one was found who wished to revenge his death.

Vengeance is sometimes transferred from an immediate to a remote object. The Otoes being on one occasion encamped near Mr. Lisa's trading establishment, many of their number became intoxicated with whiskey, and troublesome to the traders. But in order that the latter might not receive personal injury, two warriors were appointed by the chiefs to stand guard at the door of the house, with orders to repel all drunken individuals. Having consumed all the whiskey that had been given them, they clamorously demanded more, but the trader persisted in refusing it to them. Incensed at this denial, the grand chief Shongatonga, who was himself slightly intoxicated, went into the house, and meeting one of the traders near the door, he gave him a slight push with his hand, unobserved by Hashea, the Cut-nose, who was then on guard. The act, however, was perceived by an Indian who reclined against an outhouse, at a little distance, smoking his pipe. He advanced, apparently with perfect indifference, and taking up a keg, the only weapon which presented, he approached Shongatonga, and discharged it with all his strength, full upon the head of that chief, who was knocked down senseless by the violence of the blow.

The Little Soldier, a brother-in-law of Shongatonga, who was present at this assault, immediately seized his tomahawk, and making a threat, rushed out of the house, his silver armbands and other ornaments, with which he is usually profusely decorated,

sounding as he passed; he halted for an instant at the door, in order to distinguish some object on which to wreak his vengeance; espying amongst the crowd of Otoes, one from whom he had received an injury fifteen years before, which deprived him of the sight of one eye, he pursued him, and with a blow of his tomahawk brought him to the ground; this unfortunate individual, like his victor, had also lost an eye, and in this rencontre the remaining one was destroyed.

Hashea, the guard, observing that the Indians were becoming very disorderly, drew his knife, declaring that he would kill the first individual of them he could meet with, and pursuing the canaille, they fled in every direction. During this interval an inferior Indian entered the store, and pointing with his finger near to the face of Mr. Lisa, said in a threatening tone, "You are the cause of all this disturbance;" the latter immediately kicked him out of the house; on which the Indian in a rage, declared he would revenge himself for an injury so gross. Seeking some object to destroy, he encountered a sow and pigs, and appeased his rage by putting them all to death. The Little Soldier now returned, and found that his relative had recovered. Order was at length restored by the mediation of Mr. Dougherty.

But instances are not rare, in which an Indian is unwilling to punish an injury inflicted on himself, even when retaliation is amply in his power. As the troops were ascending the river, as usual, by the aid of the cordelle, several Oto Indians were sitting on the river bank at the establishment of the Missouri fur company, quietly smoking their pipes, and apparently much interested in the movements before them. One of them was accosted by a soldier, who had left his cordelle for the purpose, with an offer to purchase the pipe he was then using; but the Indian would not part with it, saying, he had no other to bear him company in his hunting excur-

sions. The soldier requested permission to examine it, but as soon as the Indian put the pipe into his hands, he twisted the bowl from the handle and ran off with it. The Indian in company with one of the traders, immediately pursued the thief to his boat, and demanded the pipe; but obtaining no satisfaction, he came to Engineer Cantonment, and stated the circumstance to Major O'Fallon, who assured him that his influence should not be wanting to procure the pipe again, and to have the offender punished by a very severe whipping. The Indian, however, with more mercy than justice, replied, that he would extremely regret the infliction of any punishment whatever upon the soldier, and he desired it might not be done; all he wished for was the recovery of his property.

The Omawhaws consider themselves superior, in the scale of beings, to all other animals, and appear to regard them as having been formed for their benefit. They will sometimes say, when speaking of a bad person, "he is no better than a brute." It is true that a magician tells his auditors that "a grizzly bear whispered in my ear, and gave me this medicine:" but his meaning is that the Wahconda, in the shape of that animal, had communicated with him.

Neither do they seem to suppose that the inferior animals accompany them to the other world, though they expect to pursue their occupation of hunting there.

In their opinion, the Wahconda has been more profuse in his distribution of gifts to the white people, than to the red-skins; particularly in imparting to us the knowledge of letters, whereby the result of experience is so readily transmitted from one person to another, so as to seem like the operation of some great mystic medicine.

But they claim a superiority in natural intelligence, and readily perceive that they are more

active, have a greater capacity for undergoing, with fortitude, the many evils to which they are subject in every situation and season, such as exposure to great heat and cold, hunger, thirst, and pain. They appear to esteem themselves more brave, more generous and hospitable to strangers than the white people; and these beneficent virtues with them, like the mental operations of faith, hope, and charity of the Christians, mark the perfect man.

They regard the white people, as very deficient in one of these cardinal virtues. They have been told by Indians, who have visited our settlements, that on entering the lodge of a white man, they will be informed that he has eaten his dinner, he will not, at least, set any food before them, and if they remain in the house, nothing is offered them until night, and even then, probably, but a stinted portion. The meanness of such demeanour they despise.

If a white man, or any stranger, enters the habitation of an Indian, he is not asked if he has dined, or if he is hungry, but independently of the time of the day or night, the pot is put upon the fire, and if there is but a single pound of meat in the possession of the family, that pound is cooked and set before him, and even if he has but just arisen from a feast, he must taste of the food, or offence is given. History has recorded, with high commendation, the name of a dethroned Christian monarch, who shared his last loaf of bread with a suppliant stranger; and surely a similar act in the Indian, although it be influenced by education and custom, is entitled to respect and applause.

They look upon the traffic in the necessaries of life, such as meat and maize, amongst the individuals of a nation, as contemptible. Such commerce they consider as a very unfavourable trait in the character of the white man; they, however, avail themselves of it in their dealings with him, provided he wants a considerable supply of those necessaries.

The food which is set before a guest, is, in every respect, considered as exclusively his own; he may give it to whom he may think proper, either within or without the lodge; he may even take it with him to his own lodgings, but the including vessel, must, in either case, be returned.

Much more food is usually served up to a guest than he can possibly eat, and when he has satisfied his hunger, if he return the remainder to the host, the latter thanks him for it, as if he had received a favour.

So exemplary is their hospitality, that every stranger, even an enemy, is protected in the habitation of an Omawhaw, as far as the power and influence of the owner extends; he is immediately invited to sit down, and no questions are put to him. The master of the house is evidently ill at ease, until the food is prepared for eating, he will request his squaws to expedite it, and will even stir the fire himself. When the guest has finished his meal, the pipe is handed to him to smoke, after which the conversation begins either vocally or by signs. As soon as it is known that a stranger is in the village, he is invited to various feasts, at each of which he must reciprocate the politeness of the host, by partaking of his fare; the stranger is not unfrequently followed from lodge to lodge by several persons, who wish to secure him as a guest in their turn.

In the kindest spirit of hospitality, they are always careful to treat their guests in the manner which they suppose will be most agreeable to them. A trader was invited to a feast, and the food being prepared, a squaw who was about to serve it up, in order to clean a bowl to contain it, began to scoop it with her curved finger. Her husband observing this usual mode of depuration, reprimanded her, saying, "I have told you that the white people do not like to see bowls cleaned in that manner, give me the vessel, and I will show you how they clean

them." He then drew out one corner of his breech-clout, and substituting it for a towel, wiped the bowl thoroughly, and returned it to the squaw. The trader, as in duty bound, tasted of the contents, but he would have preferred the agency of the finger of the squaw, to that of the old breech-clout of the husband.

An unknown stranger is led to the lodge of the principal chief, where the inhabitants collect to see him, and do not hesitate to gratify their curiosity, by looking steadfastly in his face. The stranger, if an Indian, appears perfectly at his ease, not seeming to notice the crowd that surrounds him, in order that he may not encounter their eyes. After he has eaten and smoked, he delivers his message, states his business, or tells the news. If he is seated in a small skin lodge, which contains but few persons, one of these will repeat his words aloud, that the crowd without may hear.

They are pleased with the society of the Canadian French, but they do not appear to respect them highly, because they permit too much familiarity, and are not forward in revenging an insult. The Spaniards, probably from the representations of the Pawnees, who war against them, are held in but little esteem. But it is readily perceivable, as well from their own deportment as from the representations of the French, that they respect the character of the Americans (citizens of the United States) above that of any other nation, because, they are pleased to say, we are the bravest of the white people. Previously to the late war between the United States and Great Britain, the British are said to have been deemed most valorous. But, say they, the Ioways have informed us, that, at the commencement of the war, the British promised to give the Indians who took part with them in the contest, all the territory that lies westward of a great river, (the Ohio,) over which they declared they would drive

the Americans. Their subsequent inability to comply with this promise, together with an indistinct idea of some of the conflicts, both by land and water, on our Canadian frontier, lead them to suppose that the Americans conquered in that war, and that they are now the most powerful of the nations of the earth.

Like the ancients the Indians have no rhymes in their poetry. They imitate the sounds of the voice of various animals, and of some, with so much success, as to deceive even such persons as are familiar with the animals thus imitated. This mimicry extends to the voices of the bear, bison, deer, wolves, prairie dog, turkey, owl, &c. together with those of some smaller birds, the notes of which are simple. But in these imitations we knew of no individual, whose art enabled him to execute so great a variety of notes, and with so much melody, as we have heard from civilized performers, who have publicly exhibited their talents in this way, in our cities.

An Indian at his temporary night encampment, hearing the unexpected cry of an owl, wolf, &c., is generally suspicious of its proceeding from a human enemy, who is thus endeavouring to lull him into fancied security; such sounds being often made by war parties, on their nocturnal approach to their victims, to induce a belief that the animals around them are undisturbed.

They also imitate the motions of different animals, playfully, sometimes grotesquely, in their dances.

CHAPTER III.

TRIBES AND BANDS. — FABULOUS LEGENDS. — WIT. — NINNEGAHE, OR MIXED TOBACCO. — DANCES. — OTOES. — MIGRATIONS. — LANGUAGE.

The Omawhaw nation is divided into two principal sections or tribes, which are distinguished by the names Honga-sha-no and Ish-ta-sun-da; the latter means Grey Eyes.

The first-mentioned tribe is subdivided into eight bands, viz.

1. *Wase-ish-ta.* — This band is interdicted from eating the flesh of male deer or male elk, in consequence of having their great medicine, which is a large shell, enveloped in the prepared skin of those animals. The chief of this band is the Big Elk, Ongpatungah; and it is more powerful and numerous in individuals than either of the others.

The shell, which is regarded as an object of great sanctity and superstitious reverence, by the whole nation, has been transmitted from the ancestry of this band, and its origin is unknown. A skin lodge or temple is appropriated for its preservation, in which a person constantly resides, charged with the care of it, and appointed its guard. It is placed upon a stand, and is never suffered to touch the earth. It is concealed from the sight by several envelops, which are composed of strands of the proper skins, plaited and joined together in the form of a mat. The whole constitutes a parcel of considerable size, from which various articles are suspended, such as tobacco and roots of certain plants.

No person dares to open all the coverings of this sacred deposit, in order to expose the shell to view.

Tradition informs them, that curiosity induced three different persons to examine the mysterious shell, who were immediately punished for their profanation, by instant and total loss of sight. The last of these offenders, whose name is Ish-ka-tappe, is still living. It was ten years since that he attempted to unveil the sacred shell, but, like his predecessors, he was visited by blindness, which still continues, and is attributed by the Indians, as well as by himself, to his committing of the forbidden act.

This shell is taken with the band to all the national hunts, and is transported by means of a hoppas on the back of a man.

Previously to undertaking a national expedition against an enemy, the sacred shell is consulted as an oracle. For this purpose, the magi of the band seat themselves around the great medicine lodge, the lower part of which is then thrown up like curtains, and the exterior envelop is carefully removed from the mysterious parcel, that the shell may receive air. A portion of the tobacco, consecrated by being long suspended to the skin mats, or coverings of the shell, is now taken and distributed to the magi, who fill their pipes with it, to smoke to the great medicine. During this ceremony, an individual occasionally inclines his head forward, and listens attentively to catch some sound which he expects to issue from the shell. At length some one imagines that he hears a sound like that of a forced expiration of air from the lungs, or like the noise made by the report of a gun at a great distance. This is considered as a favourable omen, and the nation prepare for the projected expedition with a confidence of success. But, on the contrary, should no sound be perceived, the issue of the expedition would be considered doubtful.

2. *Enk-ka-sa-ba.* — This band will not eat red maize. They ascribe to their family the greatest antiquity, and declare that their first man emerged

from the water, with an ear of red maize in his hand. The principal chief is Ishkatappe.

3. *Wa-sa-ba-eta-je;* or, those who do not touch bears. — This band refrains from eating the flesh of bears.

4. *Ka-e-ta-je,* or those who do not touch turtles or tortoises.

5. *Wa-jinga-e-ta-je,* or those who do not touch any kind of bird, excepting the war-eagle.

6. *Hun-guh.* — This band does not eat white cranes, as the down of that bird is their medicine.

7. *Kon-za.* — This band must not touch the green clay, or even verdigrise, both of which are used as pigments by the other bands, for ornamenting their persons.

8. *Ta-pa-taj-je.* — This band must not touch deers' heads, neither must they wear deer-skin mockasins. Many of the individuals of this band are partially gray haired. This change of the hair, which they consider as a deformity, is attributed to a violation of the above-mentioned laws prescribed by their medicine.

The second division, or tribe *Ishtasunda,* is subdivided into five bands.

1. *Ta-pa-eta-je.* — This band does not touch bison heads.

2. *Mon-eka-goh-ha,* or the earth-makers. — Of this band was the celebrated Black Bird. They are not forbidden the use of any aliment; and are said to have originated the present mode of mourning, by rubbing the body with whitish clay.

3. *Ta-sin-da,* or the bison tail. — This band does not eat bison calves, in the first year of the age of that animal.

4. *Ing-gera-je-da,* or the red dung. — This name is said to have originated from the circumstance of this band having formerly quarrelled, and separated themselves from the nation, until, being nearly

starved, they were compelled to eat the fruit of the wild cherry-tree, until their excrement became red.

5. *Wash-a-tung.* — This band must not touch any of the reptilia class of animals.

Each of these animals, or parts of animals, which the bands respectively are forbidden to touch or eat, is regarded as the particular mysterious medicine of the band collectively, to which it relates.

This singular, and, to us, absurd law, of interdiction, is generally rigidly observed; and a violation of it, they firmly believe, will be followed by some signal judgment, such as blindness, gray hairs, or general misfortune. Even should the forbidden food be eaten inadvertently, or but tasted through ignorance, sickness they believe would be the inevitable consequence, not only to the unfortunate individual himself, but involving his wife and children also.

The name of one of the bands of the Puncaw nation is *Wa-jaja*, corresponding to the name which the Osages acknowledge, which is *Waw-sash-e.*

We have before observed, that they take great pleasure in relating and hearing the narration of fabulous legends. The following specimen will serve to exemplify their taste in this way.

A bison bull, an ant, and a tortoise, agreed to undertake a joint war excursion, against the village of a neighbouring nation. As the latter associate was a slow walker, it was mutually decided in council, that he should set out on the journey immediately, to be followed in a short time by his more active companions. The tortoise accordingly departed alone, making his way through the grass, with as much rapidity as possible. After a proper interval had elapsed, the bull also set out; and lest he should lose his fellow traveller, he consented to take him on his back. On their way the two champions were obliged to cross a miry place, in the midst of which they overtook the tortoise, struggling onward with

the utmost labour, and apparently almost exhausted. They did not fail, as they passed gaily by the sluggish reptile, to express their surprise at his unusually tardy movements, and at the circumstance of his being apparently almost subdued by the first obstacle that presented itself. The tortoise, however, not at all discouraged, requested them to continue their journey, and expressed his confident expectation of being able to extricate himself from the mire, without the aid which they did not seem forward in offering to him. The two companions arrived at the village of the enemy, and were so incautious in their approaches to it, as to be discovered by the inhabitants, who sallied out upon them, and succeeded in wounding them both. The tortoise at length reached the village, and was also discovered, but had the additional misfortune of being taken prisoner.

To punish him for his presumption, the enemy resolved to put him to death in such a manner as would be most painful to him. They accordingly threatened him successively with a number of different forms of torture, such as baking in hot embers, boiling, &c., with each of which the captive artfully expressed his entire satisfaction. They finally proposed to drown him; and this mode of punishment being so earnestly protested against by the tortoise, they determined to carry it into immediate execution.

With this view, several of the enemy carried him out into a deep part of the river, and threw him in.

The tortoise, thus released, and, through the ignorance of the captors in the art of torturing, abandoned to an element in which he could act freely and with much power, dived down from their view, and rising again, dragged two or three of them under water successively, and scalped them. Then rising above the surface of the water, he exhibited the scalps triumphantly to the enemy, who stood in

crowds upon the bank of the river, unable to injure him. Content with his fortunate achievement, the tortoise now journeyed homeward; and on arriving at his lodge, he found there the bull and ant, both in bed, groaning piteously with their wounds.

Upon the reality of such stories, many of the auditors seem to rely with implicit faith, particularly as their occurrence is referred to the chronology of former times, by such a prefatory notice as "once upon a time." The narrator proceeds with a degree of gravity of feature suitable to the nature of the events of his story; and notes a variety of little circumstances in detail, which contribute much to give the whole an air of truth to his auditors, who listen with an undivided attention, uttering occasionally an interjection, as their feelings are excited.

That the inferior animals did, in ancient times, march to battle with simultaneous regularity, that they conversed intelligibly, and performed all the different actions of men, many of them appear to admit, with as much faith as many equally absurd doctrines are believed in Christendom. But these qualities are supposed to be no longer inherent; and if an animal should now speak with the voice of man, it is either the effect of the immediate inspiration of the Wahconda, or the apparent animal is no other than the Wahconda himself incarnate.

The Indians sometimes indulge in pleasantry in their conversation; and Shaumonekusse seemed to be eminently witty — a quality strongly indicated by his well-marked features of countenance. Their wit, however, is generally obscene, particularly when in conversation with the squaws.

Washingguhsahba, conversing familiarly with a Frenchman, who had long resided in the Omawhaw village, observed that the white people, being in the habit of reading books with the desire of acquiring knowledge, probably knew the cause of the difference of colour which exists between themselves and

the Indian; he therefore requested information from the Frenchman on this subject. The latter, assuming an air of great gravity, assured him that the cause was very well known, and was no other than that the Indian was formed of red horse-dung. The chief, with every appearance of candour, which, however, he did not feel, instantly placed his hand on the arm of his companion, and replied that this observation was a convincing proof of the great knowledge of the white people, and that they were perfectly familiar with the early operations of the Master of Life. He had no doubt, he said, that they were equally well informed as to the matter out of which they were themselves formed; but if he, a poor ignorant Indian, with no knowledge but his own, might venture to give his opinion, he would say, that they were formed of the excrement of the dog, baked white in the prairie.

They sometimes employ an indirect method of communicating information, and of explaining some particular acts of their own, which may have been erroneously construed by others.

Several Omawhaws, accompanied by a Frenchman, one day passed our cantonment, on their way to the trading house, with a considerable quantity of jerked meat. On their return they visited us; when one of them, who amused himself by turning over the leaves of a book in search of pictures, being asked by a squaw, in a jocular manner, what the book said, replied, "It tells me, that when we were taking our meat to the trading house, we wished to present some of it to white people on the way, but that the Frenchman would not permit us to do so." This remark explained the reason of their having offered us no meat.

An Indian, observing that one of our men, when cutting wood, uttered the interjection *hah!* at each blow with the axe, smiled; and asked if it assisted him, or added force to the blow.

The Kinnecanick, or, as the Omawhaws call it, *Ninnegahe*, mixed or made tobacco, which they use for smoking in their pipes, is composed partly of tobacco, and partly of the leaves of the sumack (rhus glabrum); but many prefer to the latter ingredient, the inner bark of the red willow (cornus sericea); and when neither of the two latter can be obtained, the inner bark of the arrow wood (viburnum) is substituted for them. These two ingredients are well dried over the fire, and comminuted together by friction between the hands.

Their pipes are neatly made of the red indurated clay, which they procure from the red pipestone branch of the Sioux river. The mass is readily cut with a common knife.

They frequently eject the smoke through the nostrils, and often inhale it into the lungs, from which it is gradually ejected again as they converse, or in expiration.

An Omawhaw, after an eructation of wind from the stomach, is often heard to say, "*How-wa-ne-ta,*" thank you, animal; which they explain by saying, that some animal has presented itself to the hunter. The exclamation, however, has but an obscure meaning, and may be compared as somewhat similar to the "God bless you" of the French, after the convulsion of sneezing.

They indulge much in the pleasures of dancing, and their dances are of various denominations; of which the following may be particularized.

The calumet dance, *nin-ne-ba-wa-wong*, is a very favourite dance. It is usually performed by two individuals, in honour, and in the presence, of some one of their own or of a neighbouring nation, with the expectation of receiving presents in return. A person who intends to perform this dance sends a messenger, bearing a small skin containing tobacco to fill a pipe, to the individual whom he intends to honour. If the proposed compliment should not be

acceptable, it is refused in the most courteous manner, with excuses based upon poverty, and with many thanks for the honour intended. If, on the contrary, the tobacco should be accepted and smoked, the act shows that the visit also will be acceptable; and a time is fixed for the performance of the ceremony. At the appointed time, the dancers, with two selected companions, repair to the place of their destination, and are invited into the lodge of the person whom they addressed. After a short time, the calumet is placed upon a forked support, which is driven into the soil in the back part of the lodge. Notice is then given to the bearer of the calumet respecting the time when it will be convenient for the dance to take place. The bearer of the calumet is now considered as the *father*, and addresses the individual whom he is about to honour by the title of *son*, presenting him with some valuable articles; such as a gun, kettle, blankets, and clothing and ornaments for his youngest child, who is destined to represent the father, or the adopted son, at the ensuing ceremony.

At sunset the calumet is taken from the forked stick, or support, enveloped like an infant in swaddling clothes, and placed carefully in a bed, prepared for its reception; a lullaby is then sung, accompanied by the music of the rattle, for its quiet repose. On the following morning it is *awakened* by a song, with the same music, and again consigned to its forked support. The appointed day having arrived, a space of sufficient diameter, is enclosed by a skreen of skins for the dance, and a post is fixed in the earth, near the entrance to the area. Around this area the principal men of the nation seat themselves; the adopted son leads in his youthful representative; and the two dancers, decorated with paint, and entirely destitute of clothing, with the exception of the breech-cloth, commence the dance. They are each provided with a decorated calumet stem, and a rattle

of dried skin, or a gourd, containing pebbles, with which to keep time to the music of the gong, and to the vocal chanting of the musicians of the village. They dance in the ordinary manner of the Indians, and pass backwards and forwards between the entrance and back part of the area, endeavouring to exhibit as much agility as possible in their movements, throwing themselves into a great variety of attitudes imitative of the actions of the war eagle, preserving at the same time a constant waving motion with the calumet in the left hand, and agitating the gourd in the right, more or less vehemently, agreeably to the music.

Warriors and braves will now bring forward presents of horses, guns, &c. The bridle of the horse is attached to the post, by the donor, who receives the thanks of an old crier, stationed there to perform that duty. The music now ceases, whilst the donor *strikes the post,* and recounts his martial deeds, and boasts of the presents which he has made at different times on similar occasions. Sometimes during the ceremony, a warrior will take the gong from the performer, and strike upon it as many times as he has achieved brave and generous actions; he then sets it down, and no one must dare to touch it, but such as can strike upon it more frequently than the first; if this is done, the gong is returned to the performer.

The calumet dance sometimes continues two or three days; but each night the calumet is consigned to its repose in the bed, with the same ceremonies as those of the first night.

When all the presents have been made which the dancers have reason to expect, they depart immediately with them to their own nation or lodge.

Instead of striking the post, the donors sometimes strike lightly upon the persons of the dancers themselves.

The presents sometimes made at these dances are very considerable. Ongpatunga once danced the

calumet to Tarrarecawaho, the grand Pawnee chief, and received from him between eighty and ninety horses. The Pawnees are indeed distinguished both for their liberality and dexterity at this ceremony. They gave one hundred and forty horses last autumn to the Otoes, who performed this dance at their village. A party of Pawnees once danced at the Omawhaw village, and gave so much satisfaction to many individuals of this nation, as to receive extraordinary presents from them. On this occacion, one person, in the warmth of his feelings, brought forth his child, and presented it to them, as the most precious gift in his power to bestow. The Pawnees accepted this gift; but on their departure, they returned the child to its parent, accompanied by the present of a fine horse, upon which it was mounted.

The dance of discovering the enemy.—This dance is sometimes performed in honour of strangers; at other times, chiefs are invited by the warriors, who wish to exhibit their generosity in presenting them with horses, and to detail their own warlike feats in the ceremony of striking the post. The chiefs, on this occasion, seat themselves in a circle, on the outside of which the warriors are also seated in a ring or circle, concentric with that of the chiefs.

These arrangements being completed, the music strikes up, and a warrior advances, who takes a war-club and *crow*, provided for the purpose; the latter of which he belts around his waist. He then dances with a slow, shuffling motion, around the exterior circle, exhibiting at the same time a pantomimic representation of his combats with the enemy.

By and by the music beats a quicker time, and calls for corresponding movements on the part of the dancer, until at length both cease simultaneously. The warrior then advances to the post, which he strikes with his club, and proceeds to detail one of his deeds of war. This done, the music recalls him

to the dance, and after a short time again ceases, that he may continue his chivalric history.

This alternate dance and recitation continues until the tale of the warrior is told; when he resigns his crow and war-club to another, who continues the amusement in like manner. Most of the dancers present horses to the chiefs, after the performing of their respective parts; and it is generally the case, that each chief invited is rewarded with one of those animals in return for the honour of his attendance.

The bear dance, *Mot-chu-wat-che.*—This is a *medicine* dance, not distinguished by any very remarkable traits. The dancers, however, imitate the motions of the bear; and songs, in which there are many words, are sung.

The beggar dance. — This has been already described in our account of the visit of the Otoes, at our cantonment last autumn. This is probably the dance mentioned by Carver, in page 158. of his work; the performance of which, on his landing near Lake Pepin, by a party of Chippeways, was the cause of much alarm to his party.

The bison dance, *Ta-nuguh-wat-che.*—The performers in this dance are painted black, and are naked from the waist upward, with the exception of the head dress, which is composed of the skin of the head of a bison, the face of which is cut off and rejected; so adapted to the top of their head as to resemble a cap, the horns projecting forward in such a manner as to correspond with their appearance when on the head of the bison. Attached to this head dress, is a strip of the skin from the back of the bison, which hangs down behind to the buttocks, like a tail. In the evolutions of the dance, they imitate the actions of the bison.

Amongst the Minnetarees, is a ceremony called the corn dance; which, however, has but little claim to the title of a dance. Notice being given of this ceremony, by the village criers, the squaws repair to

the medicine lodge, in which the magi are seated, performing their incantations, carrying with them a portion of each kind of seed which they respectively intend to plant the ensuing season; as an ear of maize, some pumpkin, water-melon, or tobacco-seed. These are attached to the end of small sticks, which are stuck in the ground, so as to form a right line in front of the magi. The squaws then strip themselves entirely of their garments, and take their seats before the spectators. The magi then throw themselves into a violent agitation, singing, leaping about, pointing to the sky, the earth, the sun, and the north star, successively. After these paroxysms have subsided, the squaws arise; and each one taking her respective sticks, holds them up with extended arms.

One of the magi being provided with a large bunch of a species of bitter herb, dips it in a vessel of water, and sprinkles copiously the seeds and persons of the squaws, with much grotesque gesticulation. This concludes the ceremony; when the seeds are supposed to be fertilized, and to be capable of communicating their fertility to any quantity of their kind.

The women then assume their clothing, and return home, being careful to deposit the fertilized seed with their stock; after which they may proceed to planting as soon as they please.

We were informed that on some particular occasion, a large enclosure was constructed in the village of the Minnetarees, which was covered with jerked meat, instead of skins. The distinguished warriors who were concerned in the ceremony about to take place, deputed some of their party to summon a certain number of the handsomest young married squaws of the village, who immediately repaired to

the meat-covered lodge, with the consent of their husbands. The squaws were then disrobed in the midst of a considerable number of the bravest of the Minnetaree warriors; and after the conclusion of some ceremonies a *brave* entered, leading by the halter a very fine horse. He selected a squaw, whose beauty struck his fancy; and advancing to her, he laid the cord of the halter in her hand. She accepted the present, and immediately admitted him to her favour. Other warriors appeared in succession, leading horses, all of which were very readily disposed of in the same manner. This ceremony occurred during the day, and in the presence of the whole assembly.

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What length of time the Omawhaws have resided on the Missouri is unknown; but it seems highly probable that they were not there when Mr. Bourgmont performed his journey to the Padoucas, in the year 1724, as he makes no mention whatever of them. It would seem, indeed, that they had separated from the great migrating nation, that we shall further notice below, on or near the Mississippi, and that they had since passed slowly across the country, or perhaps up the St. Peter's, until they finally struck

the Missouri at the mouth of the Sioux river. This is rendered highly probable by the circumstance of Carver having met with them on the St. Peter's in the year 1766, associated with the Shienne and others, all of whom he represents as bands of the Naudowessie nation.

The Oto nation of Indians is distinguished by the name of *Wah-toh-ta-na.* The permanent village of this nation is composed of large dirt lodges, similar to those of the Konzas and Omawhaws, and is situate on the left bank of the river Platte, or Nebreska, about forty miles above its confluence with the Missouri. Although this nation distinguish themselves by the name of Wahtohtata, yet when questioned respecting the signification of the word, they say it ought to be pronounced Wah-toh-ta-na, or Wa-do-tan, which means those who will copulate. This singular designation which they have adopted, was applied to the nation in consequence of their chief, at the period of their separation from the Missouries on the Mississippi, having carried off a squaw from that nation. The nation is, however, only known to the white people by the name of Oto, Otto, or Othouez.

It thus appears, that their name has been adopted subsequently to the migration and partition of the great nation of which they were formerly but a band. This great nation, they say, originally resided somewhere to the northward of the great lakes; and on their emigration southwardly, after performing a considerable journey, a large band of them, called *Ho-ro-ge,* or Fish Eaters, from their fondness of fish, separated from the main body, and established their residence on the margin of a lake. This band is now known by the name of Winnebagoe.

During the journey of the great nation, another band separated from them on the Mississippi, and received the name of *Pa-ho-ja,* or Gray Snow, which they still retain; but are known to the white people by the name of Ioways, or Aiaouez. They have,

however, been distinguished by the name of *Pierced-noses*, as this was erroneously believed to be the meaning of the word Pahoja; and it will be confessed that the distinction is somewhat nice, when we learn that the true word for pierced nose is *pa-o-ja*.

Another band seceded from the migrating nation, and established a village at the mouth of the Missouri river; from which circumstance they received the name of *Ne-o-ta-cha* or *Ne-o-ge-he*, signifying *those who build a town at the entrance of a river;* they have been known to us only by the name of Missouries.

The Otoes also separated from the nation on the Mississippi; and pursuing their journey across the country from that river, struck the Missouri near the confluence of the Great Nemawhaw. Here the Otoes remained a considerable time for the purpose of hunting; and it seems probable, from the name of the creek, that they also reared maize, and cultivated the soil after their rude manner, as the word Nemawhaw, in their language, signifies *water of cultivation; ne*, water, and *maha*, planting or cultivating. From this locality the Otoes proceeded up the river to the Platte; and after hunting for some time near its confluence, they moved still further up the Missouri, and established a village on its bank, about fourteen miles below Council Bluff. In this position they remained several years, during which time a band of the Ioways took up their residence about one year, on the bank of the river nearly opposite to them, and within about thirty miles of the present site of the Omawhaw village. The Otoes subsequently removed to the river Platte, about twenty miles above their present village; but finding the latter situation to be a more eligible one, they permanently established themselves there, and have already occupied it nearly half a century.

The Ioways, after having resided in a village on

the lower part of the Missouri a considerable space of time, were rejoined by the band above mentioned; when they abandoned their position, and returned to the waters of the Mississippi and erected a village on the *Moyene*, where it still remains.

The Missouries in process of time abandoned their village near the mouth of the river Missouri, and gradually moving up the river, at length constructed a town on the left bank, near the entrance of Grand river. In this position they were found by the French, who built a fort on an island of the Missouri, in their immediate vicinity, about the beginning of the last century. The garrison of this fort was entirely destroyed, according to Du Pratz, soon after its commander, the enterprizing Bourgmont, left it.

The author whom we have just mentioned further informs us respecting this nation, that "the Spaniards, as well as our other neighbours, being continually jealous of our superiority over them, formed a design of establishing themselves among the Missouries, about forty leagues from the Illinois, in order to limit our boundaries westward. They judged it necessary for the security of their colony, entirely to cut off the Missouries; and for that purpose they courted the friendship of the Osages, whose assistance they thought would be of service to them in the enterprise, and who were generally at enmity with the Missouries. A company of Spaniards, men, women, and soldiers, accordingly set out from Santa Fe, having a Dominican for their chaplain, and an engineer for their guide and commander. The caravan was furnished with horses, and all other kinds of beasts necessary; for it is one of their prudent maxims, to send off all those things together. By a fatal mistake the Spaniards arrived first amongst the Missouries, whom they mistook for the Osages; and imprudently discovering their hostile intentions, they were themselves suprised and cut off by those whom they intended for destruc-

tion. The Missouries some time afterwards dressed themselves with the ornaments of the chapel; and carried them in a kind of triumphant procession to the French commandant among the Illinois." A terrible but just revenge! The Missouries continued to dwell in the same locality, until, about twenty years since, they were conquered and dispersed, by a combination of the Sauks, Foxes, and some other Indians; when they united their destiny with other friendly nations. Five or six lodges joined the Osages; two or three took refuge with the Konzas; and the chief part of the remainder amalgamated with the Oto nation, with whom they still reside. Thus connected, their manners, habits, and language being very closely allied, the Otoes and Missouries may be considered as one nation. They are probably the bravest of the native inhabitants of the Missouri; and there are but few males who have arrived at the age of maturity, that have not fleshed their arms in battle. Indeed, many of them can *strike* upon individuals of almost all the neighbouring nations, not excepting the distant Indians of Mexico, and the Spaniards themselves.

In vain should we seek among the nations of the Missouri for an individual whose daring deeds have been more numerous than those of the Little Soldier, or for more brave and generous combatants than Shaumonekusse, Hashea, Nahojeningya, and Wasacaruja. It is not fear, but probably a generous forbearance, that has restrained them from killing more than two white men within the memory of the present generation. Of these, one, a Frenchman, was killed by A-kira-ba during the Spanish government; and the other, a Spaniard, by Shaumonekusse, more recently, at the sources of the Arkansa; an act, which, although attended by an extraordinary display of bravery, yet it was declared by this young warrior to be the only martial act of his life that he was ashamed of.

The hunting grounds of the Oto nation extend from the Little Platte up to the Boyer creek, on the north side of the Missouri, and from Independence creek to about forty miles above the Platte, on the south side of that river. They hunt the bison between the Platte and the sources of the Konza rivers.

A few years since, their numbers were very much diminished by the small-pox.

The language of the Otoes, Missouries, and Ioways, although the same, is somewhat differently pronounced by these respective nations or tribes. The dialect of the Ioways is more closely allied to that of the Oto than to the Missouri dialect; the former differs chiefly in being pronounced more sharply, as in the word In-ta-ra, *friend*, which in the Oto is In-ta-ro. The Missouri dialect differs in being more nasal; the children, however, of this nation being, from their residence among the Otoes, in constant habits of association with the Oto children, are gradually assuming the pronunciation of that nation.

Originally the same, and still very similar to the above dialects, are those of the Osages, Konzas, Omawhaws, and Puncaws, the individuals of each of which nations can make themselves reciprocally understood, after a very little practice. The two latter dialects are so very closely allied, as not to be distinguishable from each other, by persons who are not very critically acquainted with the language. The Omawhaw and Puncaw pronunciation is more guttural than that of the two former, of which, particularly the Osage, the pronunciation is more brief and vivid.

The free and independent spirit of the Indian is carried even into their language, and may be recognised there by its absolute destitution of a single word drawn from the language of a civilised people. Thus, notwithstanding their constant familiarity with

certain traders, and with various articles of the manufacture of the white people, they universally, and in every instance, reject the names which they originally hear for such men and things, and apply others, which they readily invent.

CHAPTER IV.

BOYER'S CREEK. — VISIT TO THE PAWNEES. — HUMAN SACRIFICES. — ANECDOTE OF PETALESHAROO. — APPENDIX.

On the 12th, Lieutenant Graham, Lieutenant Talcott of Camp Missouri, Mr. Seymour, and I, accompanied by a soldier, departed in our small row-boat, for the purpose of ascending Boyer creek, and ascertaining the point at which that stream discharges from the bluffs. The rapidity of the Missouri current soon transported us to the mouth of the creek, and we encamped, after ascending it the distance of a few miles. From this point Messrs. Graham and Talcott crossed the bottom lands, to the base of the bluffs, and by trigonometrical observation, ascertained the altitude of the highest point to be three hundred and fifty feet above low water mark of the Missouri. The next day we continued our voyage, but about noon, perceiving that some necessaries had inadvertently been omitted in our loading, we despatched the soldier to the cantonment to procure them.

The following morning we were awakened by the loud cries of the sandhill crane, performing evolutions in the air, high over their feeding grounds. This stately bird is known to authors by the name of grus canadensis. It is mentioned by the enterprizing and excellent traveller, Bartram, in his work, and is very distinct from the grus Americanus of authors, or hooping crane, although many persons have supposed it to be no other than the young of that gigantic species. The sandhill crane, in the spring of the year, removes the surface of the soil by

scratching with its feet, in search of the radical tubers of the pea vine, which seem to afford them a very palatable food. Near our present encampment, and in many other situations bordering on streams of water, where this plant vegetates in the greatest profusion, we have frequently had occasion to observe that the surface of the soil was removed in small and irregular patches, by the industry of this bird in seeking for its favourite food.

This crane is a social bird, sometimes assembling together in considerable flocks. They were now in great numbers, soaring aloft in the air, flying with an irregular kind of gyratory motion, each individual describing a large circle in the air independently of his associates, and uttering loud, dissonant, and repeated cries. They sometimes continue thus to wing their flight upwards, gradually receding from the earth, until they become mere specks upon the sight, and finally altogether disappear, leaving only the discordant music of their concert to fall faintly upon the ear.

Mosquitoes have already made their appearance in small numbers.

April 14th. The messenger returned and the voyage was continued. The creek was found to be very tortuous, and the navigation much impeded by fallen trees, extending in various directions across the stream, obliging us to resort to the use of the axe in many places, to obtain a passage for our boat. In the evening we arrived at the bluffs. The water had now become so shallow as not to admit of our further passage with the boat, which was left under the care of our man, and having made the necessary observations for ascertaining the latitude, on the following day we took our blankets on our backs, and proceeded on foot, intending to travel one day's journey further along the stream. At the distance of about five miles, the high grounds closely bounded the creek, and the valley, which below is extensive

and fertile, disappears. We saw numbers of the smaller species of rattle-snake, which had, no doubt, but lately left their winter dwelling. The creek, as observed this afternoon, although still about thirty feet wide, is, in some places, not more than six inches deep, whilst in other parts it is two or three feet. As we went forward, the timber gradually decreased in quantity, until finally it was interrupted into remote small assemblages of trees, under one of which we spread our blankets, after a sultry day's march over a tolerably fertile country. Numbers of ant hills are dispersed over the soil, and in many places are abundant; we could not choose but admire the assiduous industry of the little inhabitants, who were now engaged in repairing the structures for the approaching season of activity. The autumnal conflagration, which had comprehended within its destructive range almost the whole surface of the country, had consumed a large portion of the fragments of wood, which, intermixed with earth, forms the exterior wall of their mounds; these the emmets were now unremittingly employed in replacing, with half-burned sticks, which were sought for in every direction. Verdure was appearing in favourable situations, and the ash was in full bloom, which tree, associated with the elm and willow, comprehends the chief portion of the few trees that were here seen. In the night we were awakened by a heavy fall of rain, and our attention was directed to personal safety by tremendous thunder and lightning, directly in the zenith, and we abandoned our guns and blankets to take refuge in the open prairie. This situation was peculiarly uncomfortable; we had been languid and oppressed by the heat of the sun during the afternoon's walk, and we were now shivering under the effects of cold and moisture. In the intervals we kindled our fire, and became alternately, partially dry, and wet, as the fall of rain intermitted and recurred.

At the dawn of day we retraced our path, and found the tent pleasantly situate in an embowered spot, where three rattle snakes had been killed by the soldier in pitching it. On the following day we descended the creek.

18th. The creek was rapidly subsiding, so that a bridge constructed by the Omawhaws, which we had passed almost unobserved, was now two feet above the surface of the water, and rendered it necessary to unload the boat in order to drag her over. This structure is very simple; a double series of stout forked pieces of wood are driven into the bottom of the creek, upon these, poles are laid transversely, crossed by numerous smaller pieces, which form a support for dried grass covered by a proper quantity of earth. What necessity gave rise to the building of this bridge we know not, and we are inclined to believe, that bridge-building is a rare effort in our aboriginal architecture.

On the 20th, Major O'Fallon set out on a visit to the Pawnee villages, accompanied by Captain Riley, Adjutant Pentland, Lieutenants Talcott and Graham, Mr. Dougherty and myself, together with a guard of twenty-seven men, and with seventen pack and riding horses. In recording the events of this journey, it would be superfluous to note the appearance of the country over which we passed, or to describe the magnitude and direction of the water courses that intersect the route, as this will be detailed in another part of the work; our attention in the few following pages will be more particularly directed to our transactions and interviews with the natives. In the course of the two following days, we met with several Oto and Omawhaw Indians, who were occupied with hunting and trapping. On the 23d we halted a short time with a party of the latter nation, headed by a man of much note, known to the traders by the name of the *Voleur*, the relics of whose former village, we had previously observed on Shell Creek.

Near this stream of water we examined a great excavation in the brow of a bluff, to which the name of *Pawnee Medicine* has been applied, in consequence of its being an object of superstitious reverence to the people of that nation. It is evidently an artificial work, and the product of much labour, being about two hundred feet long, one hundred and thirty feet wide, and thirty deep. The origin and object of this effort of savage labour is involved in mystery, and the Pawnees cannot, at this day, give any rational history of it; the only advantage which we can suppose people to have derived from such a work, is security from the attack of a powerful enemy. An entire nation may have here defied the efforts of some allied army of an extensive coalition. We are inclined to conjecture, that the nation that has left us this monument of a primitive military art, is no other than the Rickarees, who now reside on the banks of the Missouri, between the Sioux (Dacota) and Mandan nations, and who are, beyond a doubt, a branch of the Pawnee stock, and probably are more immediately descended from that branch of it, now known as Pawnee Loups. We are led to this conjecture, however, only from the fact, that ruins of their former village, apparently coeval with the excavation, exist within two miles of Beaver Creek. In this vicinity, several antelopes (Cervicapra Americana, Ord) were seen by the party, but they were so shy and swift, that it was not possible to kill one of them.

On the succeeding day, a large body of Indians was observed in the distance moving towards us, which proved to be the principal portion of the Oto nation, who were now returning to their own village, from a trading visit to the Pawnees. We here met with numerous acquaintances, who saluted us cordially, although they appeared somewhat jealous of our visit to the Pawnees. The Little Soldier rode up with great animation, and communicated to some

of us, by means of signs, an intimation that a glorious battle had been fought by a party of Pawnee Loups, in which the greater part of them had been killed, and nearly all the remainder of them wounded.

We resumed our journey, and at the distance of two or three miles observed numerous horses grazing over the plain, squaws occupied in pitching skin lodges, and men advancing to meet us; they were soon recognized for Omawhaws, and informed us that they were engaged in hunting. We were soon joined by the Big-horse, Crenier, and other chiefs and warriors of the Oto and Omawhaw nations, who remained a considerable time, and received a small present of tobacco at parting.

At Willow Creek, several Pawnees were observed on the opposite side at a distance, who avoided us, and as we continued on during the afternoon, many of them appeared at different times and places, on the bluffs, which, at a little distance, bounded our route to the right; but, like the first we had seen, they would not approach our party, but retired on our advancing towards them.

The evening encampment was pitched at a favourable position, on the bank of the Loup Fork, where we found a boy guarding horses; he had a melancholy air, and his appearance interested us much; a number of squaws had fled at our approach, but he remained unmoved. He invited us to continue onward to the village, stating the probability of a fall of rain on the coming night. "Are you not afraid," we asked, "to remain here all day, at such a distance from your village?" No," said he, with the utmost indifference; "the Sioux have not been here this long time past, but I saw a great many men and horses to-day on the opposite side of the river: they may have been Sioux: I don't know." Being presented with a biscuit, he ate part of it, and put the remainder in his belt for his parents, that they might taste of the food of the white people.

In the evening Semino, a Canadian interpreter residing with the Pawnees, arrived with a letter from Mr. Papan *, (a trader in the nation,) stating, that as some misunderstanding had occurred amongst the chiefs, Tarrarecawaho had declined meeting the party, to escort us into the village, as he had previously intended to do.

This conduct of the chief was altogether unexpected, inasmuch as he had invited the agent, at the autumnal council, to visit his village, and requested him to halt his party at some distance, and inform him of his proximity, that he might be received with due ceremony. Major O'Fallon, immediately perceiving the necessity of supporting the dignity of his mission in the eyes of these Indians, in order the more effectually to command their respect, directed the messengers to return forthwith and tell that chief, that he must consider well whom he is about to receive; if he will not meet me in a proper manner, I will pass through his village, without looking at him or his people, and visit the next village, and so on to the third; and if I shall not be properly treated at either, I will return to Camp Missouri to count the graves of the soldiers whom he has heard died there." No further communication was received respecting the intentions of the great chief, and early on the succeeding morning our journey was resumed.

After riding a considerable distance over a beautiful plain, we came in view of the village of the Grand Pawnees, and saw in every direction great numbers of horses and mules, and a few asses attended by men and boys. At some distance on the left, the Loup Fork meandered, on the bank of which stream was a long line of squaws bearing

* I gladly avail myself of the opportunity of noticing the many attentions which we received from this gentleman. At this time particularly, he rendered us essential services, in which he appeared to take much pleasure.

heavy burdens of fuel towards the village. A chief was soon observed advancing with rapidity; he was received by our cavalcade with music playing, and flags displayed, and was recognized to be Sharitarish, eldest son of the chief of that name commemorated by Lieutenant Pike, and now second chief of the Grand Pawnees; the interpreters being absent, no particular communication was interchanged, and we moved on. A short time, however, only elapsed before Tarrarecawaho approached in full dress. We could not choose but admire the lofty dignity of his appearance; but his extreme hauteur became manifest when he halted at the head of our line, by not offering his hand, or even deigning to look at us. This deportment was reciprocated, and we moved onward again without particularly noticing him, excepting by the short intermission of movements which had taken place, we were soon informed from the rear, that the Grand Chief was making signs to induce us to halt; but finding that his imperious deportment gained no respect, and that his present request was altogether disregarded, he at once relinquished the high grounds which he had seemed anxious to maintain, and riding forward, he condescended to offer his hand to each of us in succession. The interpreters having rejoined the party, Major O'Fallon was enabled to communicate with the chief and principal men, such as Taritiwishta, chief of the Tappage band, Ishcatappa, brother of Sharetarish, and others, who successively arrived. He then addressed Tarrarecawaho briefly thus: "Long Hair, I have come to visit you agreeably to your invitation, and desire to know whether or not you are glad to see me." The chief answered, "That I am glad to see you, the display of these medals on my dress, and those flags of your nation which are waving in my village, will amply testify." He concluded by inviting us to his lodge, but we informed him that we had brought our own lodges

and provisions; we would, however, accept of his hospitality by partaking of his food. We then performed a half circuit around the village, and entered it with the sound of the bugle, drum, and fife, with which the commonalty and children seemed highly delighted, following, or rather walking beside the musicians obliquely in two extensive wings, exhibiting the form of the letter V. Of these instruments the bugle was most decidedly the favourite. We passed by and saluted the mansions of the chiefs, at each of which an American flag was hoisted, with the exception only of one that was passed unnoticed, owing to its being distinguished by a Spanish flag; which, however, was struck as soon as the cause of the procedure was understood. This ceremony being performed, the men were marched off to encamp, and we entered the dwelling of the Grand Chief. After partaking of some excellent boiled bison meat, he requested to know if we would condescend to eat at the houses of the warriors; but the agent informed him that we could only accept of the hospitality of chiefs. We were then conducted to six other feasts, in immediate succession, after which we retired to the encampment that had been formed in a low prairie near the town.

During our stay in Tarrarecawaho's lodge, Major O'Fallon spoke at some length to that chief. He informed him that thus far he was pleased with the reception he had given us; that he had come to repeat in the village, the same words that had been uttered at Engineer Cantonment, &c. The manner as well as the matter of the address, seemed to command undivided attention; every eye was rivetted upon the speaker, and the most profound silence reigned throughout a crowded audience, that preserved a respectful distance behind the chiefs that were seated directly before us.

Instead of an immediate reply, Tarrarecawaho, who alone had remained standing, addressed his

warriors in a loud, fluent, and impassionate manner: "I am the only individual of this nation, that possesses a knowledge of the manners and power of the whites. I have been to the town of the Red Head, (Governor Clarke, at St. Louis,) and saw there all that a red skin could see. Here sits a chief, (pointing to the agent,) who controls every thing in this land; if he should prohibit you from wearing breech-cloths, you could not wear them. You know that we cannot dispense with powder and balls; you must also know that we cannot dispense with this chief, as he can prevent us from obtaining them. I have no personal fear; I only dread the consequence of improper conduct, to the women and children; take pity on your women and children, warriors. When he tells you that he is a chief, he speaks truly; when he says that his soldiers appear like the grass in the spring, in place of those who die, he speaks truly; you, my nation, are like the fly in strength, just so easily can his mighty nation crush you between their fingers. Young men, I have done; to morrow I will invite the American chief to council, and if any of you wish to speak to him then, you have my consent. Do as I do; I am not ashamed of what I have done; follow my example."

He then, in a mild tone and polite manner, informed the agent that he would consult his chiefs, and would return an answer to his speech to-morrow.

Accordingly, about noon on the 26th, a messenger arrived with information that the chiefs and warriors were ready to receive the agent, and we repaired to the lodge in which the assembly was convened. They formed a circle round the chamber, sitting on grass mats; the chiefs occupied the back part of the lodge, directly in front of whom we were invited to be seated, on mats spread for our reception. A profound silence ensued, during which the eyes of the assembly were occasionally turned by a glance upon

Tarrarecawaho, who at length arose, and after a short harangue, held his pipe to the Major to smoke, signifying that he presented a horse. Several speakers succeeded, who generally presented the pipe in the same manner. After an address from Major O'Fallon, who concluded by inviting the principal men to our camp, to present them with "a pipe of tobacco," the council dissolved.

On the expiration of two or three hours, the chiefs and warriors appeared at our camp, and seated themselves on robes and blankets, before our tent, whilst several hundreds of the people encompassed us, keeping, however, at a respectful distance. When the agent had terminated some appropriate observations, he deposited before Tarrarecawaho, Sharetarish, and the Tappage chief, the presents he intended to make, in as many separate parcels. A difference having for some time existed between the two first-mentioned chiefs, the former, who was in fault, having threatened to chastise the other, and on being challenged by him, refused to decide the controversy by single combat, now availed himself of a favourable opportunity to obtain a reconciliation, by presenting to Sharetarish his entire parcel of merchandize: Sharetarish then proceeded to parcel out his double portion, consisting of fusils, powder and ball, strouding, blankets, calico, &c. amongst the multitude, reserving nothing for himself. He laid a portion at the feet of Tarrarecawaho, and this chief again performed the part of a donor, retaining only a United States' flag, and expressed his satisfaction and thanks to the agent, for the merchandize they had received. Sharetarish said, that, if agreeable to his father, (Major O'Fallon,) he would return in a reasonable time, and bring some of his young warriors, for the purpose of performing a dance.

Towards evening, Sharetarish arrived with his dancers, thirty or forty in number, who were all accoutred and painted for the occasion. This exhibi-

tion, which would have appeared to us to partake much of the terrific, did we not feel assured of their pacific disposition, bore considerable resemblance to that performed by the Otoes at Engineer Cantonment, already described, excepting that less pantomimic action was used, and *striking the post* formed no part of the ceremony. At the termination of the dance, Sharetarish presented Major O'Fallon with a painted bison robe, representing several of his own combats with the enemy, as well as those of his friends, all of which he explained to us.

27th. The tents were struck, and we departed for the village of the Pawnee Loups. At the distance of four miles, we passed the Republican village, about a mile on our left; from thence the distance is about three miles to the Loup village, over a beautiful bottom plain of the width of a mile and a half, extending along the Loup fork of the Platte. This plain is nearly thirty feet lower than that over which we had travelled, and which terminates abruptly at the Grand Pawnee village. When within two miles of the village of the Loups, a messenger requested the party to halt, in order to give the chiefs the requisite time to make their preparations to receive us in a manner suitable to the representative of a nation "so great and powerful as that of the Big-knives."

After waiting a short time, we observed, at the distance of a mile before us, a great number of mounted Indians emerging suddenly, apparently from the plain itself, for we could not then see a ravine that had previously concealed them from our view. They immediately began to ride in various directions, and to perform numerous evolutions, until the whole were arranged in a widely-extended line. These rapid movements, which attracted our attention from other objects, having ceased, we perceived a small body of men in front, whose movements were independent of the others, and who were advancing at a moderate pace. When all were formed, they set forwards,

slowly at first, but gradually increasing their speed as they approached, until they surrounded us at a full charge. It is impossible by description to do justice to the scene of savage magnificence that was now displayed. Between three and four hundred mounted Indians, dressed in their richest habiliments of war, were rushing around us in every direction, with streaming feathers, war weapons, and with loud shouts and yells. The few whom we had observed in advance of the main body, and whom, as they came near, we recognized to be the chief men, presented a perfect contrast to the others in their slow movements, and simplicity of dress. Courtesy obliged us to shake hands with each individual, as they came to us in succession for that purpose, nor was a single soldier of our train forgotten on this occasion by any one of them. They expressed great satisfaction on account of our visit, rubbing their breasts in token of the sincerity of this pleasure. Many remarked that the nation had been mourning for their grievous losses in a recent battle with an enemy, but that now grief should give place to rejoicing. Major O'Fallon addressed the Indians as usual, after which we again moved on towards the village. Latelesha, the grand chief, perceiving that the division of his warriors that were on our left, raised some dust on the march, ordered them all to leeward, that we might not be incommoded. Almost from the beginning of this interesting fête, our attention had been attracted to to a young man who seemed to be the leader or partizan of the warriors. He was about twenty-three years of age, of the finest form, tall, muscular, exceedingly graceful, and of a most prepossessing countenance. His head dress of war eagles' feathers, descended in a double series upon his back like wings, to his saddle croup; his shield was highly decorated, and his long lance was ornamented by a plaited casing of red and blue cloth. On inquiring of the interpreter, our admiration was augmented by learning

that he was no other than Petalesharoo, with whose name and character we were already familiar. He is the most intrepid warrior of the nation, eldest son of Latelesha, destined as well by mental and physical qualifications, as by his distinguished birth, to be the future leader of his people. Seeing that his father had taken a place in our cavalcade on the left of Major O'Fallon, he rode up on his right to the exclusion of a brave officer who had previously occupied that situation, and who now regarded him with an apparently stern aspect, but in which there was perhaps more of admiration than of irritation at this unexpected intrusion. The young chief caught the look, and retorted with an eye that seemed never to have been averted through fear. The name of Petalesharoo is connected with the abolition of a custom formerly prevalent in this nation, at which humanity shudders.

The Pawnee Loups heretofore exhibited the singular anomaly, amongst the American natives, of a people addicted to the inhuman, superstitious rite, of making propitiatory offerings of human victims to Venus, the *Great Star*. The origin of this sanguinary sacrifice is unknown; probably it existed previously to their intercourse with the white traders. This solemn ceremony was performed annually, and immediately preceded their horticultural operations, for the success of which it appears to have been instituted. A breach of this duty, the performance of which they believed to be required by the Great Star, it was supposed would be succeeded by the total failure of their crops of maize, beans, and pumpkins, and the consequent total privation of their vegetable food.

To obviate a national calamity so formidable, any person was at liberty to offer up a prisoner of either sex, that by his prowess in war he had become possessed of.

The devoted individual was clothed in the gayest and most costly attire; profusely supplied with the choicest food, and constantly attended by the magi, who anticipated all his wants, cautiously concealed from him the real object of their sedulous attentions, and endeavoured to preserve his mind in a state of cheerfulness, with the view of promoting obesity, and thereby rendering the sacrifice more acceptable to their Ceres.

When the victim was thus sufficiently fattened for their purpose, a suitable day was appointed for the performance of the rite, that the whole nation might attend.

The victim was bound to a cross, in presence of the assembled multitude, when a solemn dance was performed, and after some other ceremonies, the warrior, whose prisoner he had been, cleaved his head with the tomahawk; and his speedy death was insured by numerous archers, who penetrated his body with their arrows.

A trader informed us that the squaws cut pieces of flesh from the deceased, with which they greased their hoes; but this was denied by another, who had been present at one of these sacrifices. However this may be, the ceremony was believed to have called down a blessing upon their labours of the field, and they proceeded to planting without delay.

The present mild and humane chief of the nation, Latelesha, or Knife Chief, had long regarded this sacrifice as an unnecessary and cruel exhibition of power, exercised upon unfortunate and defenceless individuals, whom they were bound to protect; and he vainly endeavoured to abolish it by philanthropic admonitions.

An Ietan woman, who was brought captive into the village, was doomed to the Great Star by the warrior, whose property she had become by the fate of war. She underwent the usual preparations, and, on the appointed day, was led to the cross, amidst a

great concourse of people, as eager, perhaps, as their civilized fellow men, to witness the horrors of an execution. The victim was bound to the cross with thongs of skin, and the usual ceremonies being performed, her dread of a more terrible death was about to be terminated by the tomahawk and the arrow. At this critical juncture, Petalesharoo (son of the Knife Chief) stepped forward into the area, and in a hurried but firm manner, declared that it was his father's wish to abolish this sacrifice; that for himself, he had presented himself before them, for the purpose of laying down his life upon the spot, or of releasing the victim. He then cut the cords which bound her to the cross, carried her swiftly through the crowd to a horse, which he presented to her, and having mounted another himself, he conveyed her beyond the reach of immediate pursuit; when, after having supplied her with food, and admonishing her to make the best of her way to her own nation, which was at the distance of at least four hundred miles, he was constrained to return to his village. The emancipated Ietan had, however, the good fortune, on her journey of the subsequent day, to meet with a war party of her own people, by whom she was conveyed to her family in safety.

This daring deed would, almost to a certainty, have terminated in an unsuccessful attempt, under the arm of any other warrior; and Petalesharoo was, no doubt, indebted for this successful and noble achievement to the distinguished renown which his feats of chivalry had already gained for him, and which commanded the high respect of all his rival warriors. Notwithstanding the signal success of this enterprise, another display of the firmness and determination of the young warrior was required to abolish this sacrifice, it is to be hoped for ever. The succeeding spring, a warrior, who had captured a fine Spanish boy, vowed to sacrifice him to the Great

Star, and accordingly placed him under the care of the magi, for that purpose.

The Knife Chief, learning the determination of the warrior, consulted with his son, respecting the best means of preventing a repetition of the horrible ceremony. "I will rescue the boy," said Petalesharoo, "as a warrior should, by force;" but the Knife Chief, unwilling that his son should again expose himself to a danger so imminent, as that which he had once encountered in this cause, hoped to compel the warrior to exchange his victim for a large quantity of merchandize, which he would endeavour to obtain with that view. For this purpose he repaired to Mr. Pappan, who happened to be in the village for the purposes of trade, and communicated to him his intentions. Mr. Pappan generously contributed a considerable quantity of merchandize, and much was added by himself, by Petalesharoo, and other Indians.

All this treasure was laid in a heap together, in the lodge of the Knife Chief, who thereupon summoned the warrior before him. The chief armed himself with his war-club, and explained the object of his call, commanding the warrior to accept the merchandize and yield up the boy, or prepare for instant death. The warrior refused, and the chief waved his club in the air towards the warrior. "Strike," said Petalesharoo, who stood near to support his father; "I will meet the vengeance of his friends." But the more prudent and politic chief added a few more articles to the mass of merchandize, in order to give the warrior another opportunity of acquiescing without forfeiting his word.

This expedient succeeded; the goods were reluctantly accepted, and the boy was liberated, and was subsequently conducted to St. Louis by the traders. The merchandize was sacrificed in place of the boy; the cloth was cut in shreds, and suspended by poles at the place of sacrifice, and many

of the valuables were consumed by fire. It is not expected that another attempt will be made to immolate a human victim, during the life of Petalesharoo, or of his benign father.

Our cavalcade performed a circuit round the village, and saluted at the lodge of Latelesha, upon which the flag of the United States was hoisted; the soldiers were then marched to a proper encamping place, and we were feasted as before. Great order prevailed in this village, and silence reigned throughout, which was attributed to their loss of friends and kinsmen.

On the following day the council was held, at which eleven horses and mules were presented in the usual manner. In two instances, however, the horse was represented by a cord or halter attached to a stick. One of these cords was drawn by a little Ietan girl, that Petalesharoo had captured in some battle and adopted as his daughter; she seemed to be the favourite of his family.

In the afternoon the greater part of the population were observed coming from the village towards our camp. As they drew near, we ascertained that many were painted, armed, and decorated as if for war. Petalesharoo advanced, and gave notice that he had brought some of his warriors, for the purpose of honouring his American father with a dance. The dancers were about forty in number, and their movements and evolutions were similar to those of the Grand Pawnees. The deep-toned gong was so entirely concealed in the centre of the mass of dancers, that it was with difficulty we ascertained whence the wild and measured sound proceeded, which regulated their simultaneous movements. It was accompanied by other simple instruments, and occasionally interrupted from the ear by the piercing note of the whistle, or the sudden discharge of a gun, with the muzzle directed to the earth. At the termination of the first dance, the partizan requested

the accompaniment of our music for the succeeding dance. The music accordingly struck up, with the renewed beating of the gong; but it immediately threw them all into confusion, and after vainly endeavouring to regain their regularity, they ceased. Again the experiment was tried, and again it produced inextricable confusion. This repeated result brought a smile to the countenance of the partizan, who expressed his conviction, that his party was unable to dance to the music of the white people.

The principal men having now arrived, agreeably to invitation, they were introduced into a large skin lodge which had been erected for us by the orders of Latelesha, as our marquee was too feeble to resist a strong wind which prevailed during the day. Presents were made to Latelesha and the Metiff chief. The latter transferred his parcel to Latelesha, who laid the whole before Petalesharoo, to dispose of as he thought proper. The young chief appointed two persons to distribute them; and thus the whole was disposed of, though very unequally. The chiefs then returned their thanks and withdrew.

I passed the night at the lodge of the Metiff chief, and in the evening was amused by the exhibition of another dancing party, who concluded by inviting the chief to partake of a feast, to be given on the following day, for the purpose of dispelling his grief for the loss of his brother, in the late contest with the Indians of the Rocky Mountains.

This severe battle was fought by ninety-three Pawnee Loup warriors, against a large body of Ietans, Arrapahoes and Kiawas.

The party was led by the most distinguished brave of the village, and half brother of the Metiff chief, but of unmixed blood, and a principal supporter of the influence of that chief. The party, who were all on foot, were on their way to capture horses, but they were badly armed for a contest, and had but

twelve guns amongst them. They were proceeding cautiously along in the prairies between the head waters of the Arkansa and the Rio del Norte, when one party of their runners, or discoverers, came in with information that a great body of the enemy were ahead, and had not seen them; another party of runners soon came in with the same information. The whole now halted to wait for night to capture horses, and busied themselves in preparing their ropes and halters, and in putting themselves in the best order in case of attack. One of the party ascended a small eminence, and perceived three of the enemy mounted and coming on in full career; presently more appeared, and soon after they began to show themselves in every quarter. It was now evident to the party, that the enemy were the first discoverers, and that they were now necessitated to contend against a vastly superior force, better armed than themselves, and possessing also the advantage of being all mounted on good horses. It was obvious also that there was no hope for them, but in the display of desperate valour. Their first wish had been to gain a creek at some distance in the rear, which was margined with small timber; but as their enemy now completely surrounded them, this was impossible. The battle commenced about ten o'clock A. M., and soon raged with great fury. Every muscle was called into action in our little band, who hung firmly together, discharging their arrows and occasionally a fusee at the enemy with the steadiest aim. The dead and wounded were falling in every direction in both parties. The enemy were so numerous that numbers of their braves, armed only with a shield, having rejected their offensive weapons, hovered in front of their companions, intent only upon the acquisition of the renown dearest to the heart of the warrior, that of first striking the body of a fallen enemy; many of them were however killed, even by their own people, as they rushed along and intercepted the flight of the

arrow or bullet from its destined mark. The combatants were at very close quarters, and the arrow had its full effect. They were for some time intermingled, and contended with their war-clubs and knives. The partizan, who had been wounded severely early in the action, and had received several more wounds during its continuance, now was struck by an arrow, which buried itself to the feathers in his body. He knew the wound was a mortal one, and fell, but supported himself upon the ground to encourage his men; "My braves," said he, "fight whilst you can move a limb, and when your arrows are expended take to your knives." Looking around now upon his companions in arms, he perceived that nearly all his principal braves were killed or disabled, and with his dying words he ordered those who were still on their feet to pierce the surrounding enemy, and endeavour to save themselves in the timber of the creek. As soon as it was ascertained that their partizan was dead, his orders were carried into effect; and the remnant of the party fought their way to the creek, where the enemy abandoned them, and returned to exult over the slain. One only of the principal braves was left in this shattered band; he declared he was ashamed that he had survived, and he immediately ran back to the enemy, although much wounded, and was seen no more. The party now found that they had left fifty-three men dead, or disabled, on the battle ground, amongst whom were all their braves, who had exposed themselves to danger more than the others. Of their numbers, now diminished to forty, all were wounded, with the exception of seven only, and some of these very desperately; one individual had eight different wounds. As they had thrown off their robes, breechcloths, and leggings, at the commencement of the battle, they were now absolutely naked, and the weather was extremely cold. They made rude cars on which they drew along those who could not walk; and thus

they commenced and proceeded in their slow and laborious march to their village. During the journey some of the wounded requested to be killed, or left to die alone; and one who was wounded in the knee, after soliciting death from his brother repeatedly in vain, sought an opportunity to die, and finally plunged his knife in his heart. The party subsisted by killing a few bisons on the way, and partially clothed themselves with their raw hides; a miserable defence against the intensity of the cold.

The Grand Pawnees were more successful in war excursions during the winter. One of their parties encountered a party of Spaniards, who, my informant asserted, sought safety in flight. But it seems highly probable that a battle took place, and that many were killed; inasmuch as the victors returned with much clothing, merchandize, very handsome figured blankets, many horses, and some silver money. I was almost confirmed in this belief, by being subsequently informed that the party had certainly brought with them some scalps which were not those of Indians; and on passing through the village, I thought that some of the hair which streamed in the wind from numerous portions of human scalps, suspended on sticks from the roofs of the lodges, was taken from the heads of Spaniards.

These three bands or clans of Pawnees, although they harmonize well together at present, are not exempt from the lot of artificial distinctions; and party animosity sometimes occurs, which, in one instance, had nearly produced fatal consequences. The Puncaw Indians, having conceived themselves injured by the Pawnee Loups, applied to the Grand Pawnees for aid in obtaining redress. The latter warmly espoused their cause, and the Grand Chief marched his warriors towards the Loup village, in avowed hostility. Petalesharoo hastily assembled his warriors for defence, and sallied out to meet the enemy; but finding their numerical force to be greatly superior

to his own, he saw that the resistance which his little band could offer, though it might check their career, would, in all probability, be insufficient to repel them. He therefore rode forward between the parties, and called aloud on Tarrarecawaho, who then advanced to meet him. The young chief immediately challenged him to a single combat; let us, said he, thus avoid the copious effusion of kindred blood, which otherwise must flow upon the earth in a general battle. This proposition was peremptorily refused. Then, said Petalesharoo, I must call you an old squaw, and a coward; return to your party and select for me the bravest of your men. This being also refused, Latelesha came forward, and by amicable negociation adjusted the point in dispute. This village contains about one hundred and forty-five lodges.

29th. The horses that were *smoked* yesterday were brought this morning, and we departed on our return by way of the Republican village. When within a mile of the latter, we were again halted by a messenger, in order that the warriors might prepare to receive us properly. In about an hour they were seen issuing from the village, with four chiefs in front, who lamented aloud as they came near, in token of penitence for their offences. They proceeded to shake us by the hand, whilst about one hundred and fifty mounted, decorated, and painted warriors were rushing about us in every direction, whooping and yelling, and exhibiting such gracefulness and safety of riding as we had never before witnessed, excepting at the Loup village, of which the present display was nearly a counterpart in miniature. In this sham attack, the partizan performed the part of our defender, hovering near us, and as the warriors charged upon us, he intercepted and repelled them. I expected to recognize amongst these warriors many of the individuals who had composed the war party that we encountered near the Konza village. I therefore scrutinizingly ex-

amined the countenance and figure of each one as they successively offered their hands. But although I had on that occasion particularly noted the features of several of the war party, for the purpose of identifying them on a future time, I could now recognize but a single individual. I knew him immemediately, and judging from the Indian character, he knew me equally well; yet his physiognomy, on presenting me his hand, was not varied in the slightest degree from the expression with which he regarded my companions, many of whom he had not before seen.

After saluting at the village as before, we were invited into the lodge of Fool Robe, the principal chief, an old man of about eighty years, destitute of any thing remarkable in his appearance. The chief men being assembled, the council was immediately held. Major O'Fallon arose, and spoke at considerable length, informing them of the great power of the United States; he detailed the glaring offences of the Pawnee Republicans, and concluded by offering them peace or war, though neither of these was solicited in preference. The chief men, in reply, manifested a great desire to adjust all differences, and promised to conduct themselves better in future. Fool Robe spoke well, but with evident embarrassment. They lamented their poverty, which prevented them from presenting more than four horses, sixteen bison robes, and a package of dried meat. A chief of this nation, called Petalesharoo, who promised, at Engineer cantonment, to chastise the offenders, having neglected to execute this act of justice, retired from the village on our approach. The agent, on this account, declared to the council, that he wished never to see him again; that he did not consider him a brave man, as he was afraid to comply with his promise; and that if he ever should meet with him in council, he would compel him to sit with the young men. The council

was further assured, that the offences, which the young men of this nation had committed against white people, would be forgiven, but not forgotten. We had to regret the absence of the son of Fool Robe, a fine intelligent young man, who was engaged on some predatory excursion, at the head of one hundred and sixty warriors.

During the night a Konza war party carried off one hundred and forty horses from the village.

The following day we returned to the village of the Grand Pawnees, and received the horses that had been presented at the council by the ceremony of the pipe. A quantity of merchandize had been brought with us from Camp Missouri, to exchange for horses for the service of the troops. This was put into the hands of Messrs. Pappan and Dougherty for that purpose; and we retired to our camp, which was upon the same spot as that we occupied on the night of the 24th instant.

May 1st. Mr. Pappan and Mr. Dougherty arrived from the village, having purchased nineteen horses and mules. The price of the horses and mules averaged about the amount of thirty dollars in Indian merchandize, estimated at the St. Louis valuation.

At each of the villages we observed small sticks, of the length of eighteen inches or two feet, painted red, stuck in the earth in various situations, but chiefly on the roofs of the houses, each bearing the fragment of a human scalp, the hair of which streamed in the wind. Before the entrance to some of the lodges were small frames, like painters' easels, supporting each a shield, and generally a large painted cylindrical case of skin, prepared like parchment, in which a war dress is deposited. The shield is circular, made of bison skin, and thick enough to ward off an arrow; but not to arrest the flight of a rifle ball at close quarters.

Defended by this shield, a warrior will not hesitate to cross the path of an arrow; he will sometimes

dexterously seize the missile after it has struck, and discharge it back again at the enemy.

The lodges or houses of these three villages are similar in structure, but differ in size. The description of those of the Konzas will apply to them, excepting that the beds are all concealed by a mat partition, which extends parallel to the walls of the lodge, and from the floor to the roof. Small apertures, or doors, at intervals in this partition, are left for the different families that inhabit a lodge to enter their respective bed chambers.

In the evening Major O'Fallon presented each of us with a horse.

Several Indians came to our camp for the purpose of trading with the men. Major O'Fallon wished to obtain one of their horses, in exchange for one that he possessed; but the Indian modestly declined, saying, " My Father, the horse you offer was given by my brother, which is the same as if I had given him myself; I will exchange for almost any other horse."

Early on the following morning we departed on our return to the Missouri, with a numerous retinue of horses, amounting to more than sixty. On the way several bisons were killed, and three calves were taken alive in the chase, by throwing nooses over their heads.

On the 6th we arrived at the Missouri, after an absence of sixteen days. Much of the information we acquired, respecting the manners, &c. of the Pawnees, is incorporated in the account of the Indians of the Missouri, in some of the preceding chapters of this work.

CHAPTER V.

JOURNEY BY LAND FROM ST. LOUIS TO COUNCIL BLUFF. — GRAND RIVER. — PLAINS AT THE SOURCES OF THE LITTLE PLATTE, THE NISHNEBOTTONA, &c. — DEPARTURE OF THE EXPEDITION FROM ENGINEER CANTONMENT.

WHILE the transactions above detailed were passing, Major Long had returned from the seat of government.

On the 24th of April 1820, he arrived at St. Louis, on his way from Philadelphia to Council Bluff, to rejoin the party. He was accompanied by Captain John R. Bell, attached to the exploring Expedition by order from the War Department, and by Dr. E. James, who had been appointed to serve as botanist and geologist, in consequence of recommendations from the Honourable Secretary of the Navy, from Dr. Torrey and Captain Le Conte.

Having procured horses, and equipped ourselves for a journey in the wilderness, we left St. Louis on the 4th of May, intending to proceed by the most direct route across the country to Council Bluff.

The lands immediately in the rear of St. Louis, between the Mississippi and the Missouri, below their junction, have an undulated surface, and a deep alluvial soil. Since their occupation by permanent inhabitants, the yearly ravages of fire have been prevented, and a dense growth of oaks and elms has sprung up.

In this fact we have a satisfactory explanation of the cause of the present want of forest trees in extensive tracts on the Missouri, which appear, in every respect, adapted to the growth of timber. If these lands, called prairies, were at any former period covered with forests, it may easily be supposed, the

yearly devastations of fires breaking out in dry seasons would destroy many of the trees. The forests being thus broken, the growth of grasses and annual plants would be greatly facilitated by the nakedness of the soil, and the free admission of the rays of the sun. Forests attract rain, and impede evaporation; while the reverberation from the surface of vast plains, and deserts, tends to dissipate the clouds and vapours which are driven over them by the winds. In fertile districts like the alluvial lands of the Missouri and Mississippi, a heavy annual growth of herbaceous plants is produced, which, after the autumnal frosts, becomes dry and peculiarly adapted to facilitate and extend the ravages of fire. In a country occupied by hunters, who are kindling their camp fires in every part of the forest, and who often, like the Mongalls in the grassy deserts of Asia, set fire to the plains, in order to attract herbivorous animals, by the growth of tender and nutritious herbage which springs up soon after the burning, it is easy to see these annual conflagrations could not fail to happen.

In the Autumn of 1819, the burnings, owing to the unusual drought, continued until very late in the season; so that the weeds in the low grounds were consumed, to the manifest injury of the forests. Large bodies of timber are so frequently destroyed in this way, that the appearance has become familiar to hunters and travellers, and has received the name of *deadening*.

After the burning of the grass in the open prairies, the wind, which at that season usually blows with great strength from the north-west, carries off the ashes from the general surface into the hollows and small vallies, thus contributing to enrich the latter at the expense of the former. *

The prairie appears to have heretofore extended,

* See Wells *On the Origin of Prairies*, in the 4th number of Silliman's Journal.

almost without interruption, for several miles in the rear of St. Louis. The western portions of it are yet naked meadows, without trees or bushes. As we followed the little pathway towards Bon Homme, we passed large tracts to which the labours of the sand rat [2] had given the aspect of a ploughed field. From the great quantities of fresh earth recently brought up, we perceived the little animals were engaged in enlarging their subterranean excavations; and we watched long, though in vain, expecting to see them emerge from their burrows. It is probable the jarring of the earth under the hoofs of our horses, by giving early notice of our approach, prevented them from appearing at the surface.

In our way we passed the large hepatic spring visited by Mr. Jessup, and described in his report. It rises in the bed of a large brook, and diffuses a strong sulphurous odour, perceptible at a distance of one hundred yards. It probably derives its mineral impregnation from some decomposition in the alluvial substances through which it rises to the surface.

Eight or ten miles west of St. Louis, forests of oak and hickory begin to occur, and become more frequent towards Alexandria and Bon Homme. At evening we descended into the deep cotton-wood forests of the Missouri bottom, and a little before sunset arrived on the bank of that majestic river. Here we were politely received and entertained in the house of a gentleman formerly of New York. A large and splendid collection of books, several articles of costly furniture, and above all, manners and conversation like those of the better classes in our cities, formed here a striking contrast to the rude and solitary cabin, and the wild features of nature, in a spot where the labours of men had as yet produced scarce a perceptible change.

On the ensuing morning, May 5th, we crossed the Missouri above Bon Homme. The forests on the

north side of the Missouri were here narrow, and confined principally to the vallies.

Pond Fort, where we halted to dine, was at this time the residence of a single family. In the late war, the inhabitants of the surrounding country had collected their families and their cattle at this place, building their temporary residences in the form of a hollow square, within which their cattle and horses were enclosed at night.

In the pond, which lies along the north side of the fort, the nelumbium was growing in great perfection. Its broad orbicular leaves are somewhat raised from the water, almost concealing its surface. Its showy yellow flower, when fully expanded, is larger, as remarked by Nuttall, than that of any other plant indigenous to the United States, except the magnolia macrophylla. The nuts, of which there are several immersed in the receptacle of each flower, have, when ripe, the size and the general appearance of small acorns, but are much more palatable. The large farinaceous root is sometimes used by the Indians as an article of diet, as are also the nuts.

Our path lay through extensive and fertile meadows, stretching away to the distant horizon, and bounded sometimes by the verge of the sky, and sometimes by the margin of a forest. The elk, the deer, and the bison, the indigenous inhabitants of these delightful meadows, had been long since driven away by the incursions of the white settlers, scattered at remote intervals on the borders of the forests. The dense and uniform growth of grass had risen untrodden and uncropped, and was now waving with ceaseless undulations, as the wind swept lightly over the surface of the plain. The slender and graceful panicles of the heuchera americana, rising above the grass, resembled a grove of spears, bristling above the heads of an embattled host. Along the margins of the brooks, we noticed the beautiful spiræa opulifolia, and a slender species of

viburnum, bending under their clusters of snowy flowers.

Through the day, the weather had been fine but warm. At sunset a thunder-storm rose in the west; and the day was succeeded, almost without any interval of twilight, by the most impenetrable darkness. The wind soon rose to a tempest; and hailstones of uncommon magnitude began to fall, accompanied with thunder and lightning. Our first thought was to dismount from our horses, and shelter ourselves from the hail on the leeward side of their bodies. We were in the middle of an extensive prairie, where no other protection could be looked for. The hailstones, however, diminished in size, and soon ceased to fall; but such torrents of rain ensued, that the plain became inundated, and the frequent flashes of lightning were reflected to our eyes from the surface of a vast lake. The plains in many places having little inclination, the water of a sudden shower is drained off less rapidly than it falls. After raging with great violence for a short time, the storm ceased; but the darkness was so intense, that we did not arrive at the settlement, where we proposed to lodge, until a late hour in the night.

Soon after crossing the Missouri, we had ascended so far as to reach the general level of the great woodless plain; and after travelling a few miles, we found the surface sloping to the north-east towards the Mississippi. In the afternoon, we crossed the Darden, which enters the Mississippi eight miles above the mouth of the Illinois; and on the following morning the Cuivre, tributary to the same river, ten miles above the other. The point between the Missouri and Mississippi, near their confluence, is raised in the highest parts, probably less than one hundred and fifty feet above the water-table. It is of a deep and fine soil, which would appear rather to have subsided from the waters of a quiet ocean, than to have been brought down from above, and deposited

in its present situation by the rivers. Between the sources of the streams which descend from either side of this narrow cape, extends an irregular tongue of land, destitute of timber, and every where nearly of the same elevation; as if it had been a part of the great plain, left naked at the retiring of the ocean, and in which the vast vallies of the Missouri and Mississippi had since been excavated by the operations of those streams. The smaller rivers of this region appear, both in extent and direction, to have been wholly independent of any peculiar conformation of the original surface on which they commenced their course; and their present beds gradually deepening, and descending in the nearest direction towards the vallies of the great rivers, are in every respect such as we may suppose to have resulted from the wearing away of a great and uniform plain. At a house where we rested in the middle of the day, and which was in the highest part of the country between the Missouri and Mississippi, here sixty miles distant from each other, a well had been sunk sixty-five feet without finding water. This well passes through several strata of loam, clay, and sand; then through a narrow horizontal bed, of that peculiar substance called chalk, by Mr. Schoolcraft*; which is here intermixed with numerous angular fragments of flints, and terminates at the surface of a stratum of blue compact limestone, abounding in organic remains. We were informed, that among other things brought up from this well, were masses of carbonized wood, bearing the marks of the axe; but as these could not be found, we thought it reasonable to attribute some part of the account to the active imagination of the narrator.

From the *divide* at the sources of the Cuivre, we overlooked an extensive tract of undulating meadow; and could distinguish on the distant horizon, the wide valley, and the extensive forests of Loutre lick.

* Views of the Lead Mines, pp. 180. 227.

This stream is the first deserving notice, which enters the Missouri from the north. Its sources are several miles to the north-west of those of the Cuivre. In its valley the rocky substrata of the plain are exposed, for an extent of many miles. Near Van Babber's, where we arrived a little before sunset on the 6th, there is, in the middle of the creek, a large brine spring. Over this has been placed a section of the hollow trunk of a tree, to prevent the intermixture of the fresh water of the creek.

The sandstone, from which this spring issues, is granulated and glimmering, like that about the old lead mines of St. Michael. Like that, it is in horizontal strata, and exhibits sufficient evidence of being a continuation of the same stratum. Perceiving the same indications of fossil coal, lead, and other minerals here, as were known to exist in the same range of country on the other side of the Missouri, we listened with a credulity which seemed rather to disappoint and surprise our host, to his account of the phenomena that had appeared from time to time in his neighbourhood. The combustion of a coal-bed, or the decomposition of a mass of pyrites, has, we believe, given rise to many more astonishing stories than he related.

He gave an account of several luminous appearances that had been seen at the breaking up of winter, or in unusually rainy seasons, or at other times of the year. These had been witnessed by many persons of unquestionable veracity; but so great had been their terror on the occasion, that they could never afterwards recollect the precise spot where the light had appeared to them. He told us of two itinerant preachers, who had encountered an indescribable phenomenon, at a place about nine miles east of Loutre lick. As they were riding side by side at a late hour in the evening, one of them requested the other to observe a ball of fire at-

tached to the end of his whip. No sooner was his attention directed to this object, than a similar one began to appear on the other end of the whip. In a moment afterwards, their horses and all objects near them were enveloped in wreaths of flame. By this time the minds of the itinerant preachers were so much confounded, that they were no longer capable of observation, and could therefore give no further account of what happened. He also stated as a fact, authenticated by many credible witnesses, that a very considerable tract of land near by, had been seen to send up vast volumes of smoke, which rose through the light and porous soil, like the smoke through the covering of a coal-pit. This had in one instance been witnessed by a son of the celebrated Col. Boon, and was at first mistaken for a prairie on fire. This phenomenon also occurs at the breaking up of winter, or at such seasons as the earth is drenched by uncommon quantities of rain.

Within a few miles of the lick, are eight or nine rude furnaces, disposed in the direction of a straight line, extending about two miles. He stated, that it was not known by whom, or when they were built, nor could it be ascertained for what purpose. It was evident they had been used; but no slag cinders or any thing of the kind had ever been found, nor was it possible to conjecture for what purpose the furnaces had been constructed. We regarded all these accounts, and many others of a similar character, as a sort of traditionary evidence of the accidental discovery, at some former time, of lead, coal, or pyrites; and that this discovery, by the ignorance and credulity of the people, had been magnified into an object, to which they had at length learned to ascribe a mysterious and indefinite importance.

Immediately about Loutre lick the surface was rocky and uneven; low cliffs of light gray sandstone, fringed with tufts of the dark green pteris atropurpurea, and the black stiped asplenium, overhung

the margin of the brook, where the inconspicuous flowers of the prinos lævigatus and zanthoxylon fraxineum, and the blue spikes of the amorpha frutieosa, were just expanding.

Beyond Loutre lick the road traverses longitudinally that great woodless plain, thirty miles in length, called the Grand Prairie. It varies in width from one to ten or fifteen miles. The soil is deep and fertile, closely covered with grasses, interspersed with a proportion of gaudy euchromias and lichnedias, with the purple and yellow pedicularia, the tradescantia, and many beautiful astragali.

At Thrall's settlement, sixty miles above Loutre lick, the floerkea proserpinacoides * is found in great abundance in open fields and by the road side, reclining its flexile and delicate stem upon the species of bidens, polygonum, &c. common in such situations. It grows much larger here than at Albany, the only locality where we have met with it east of the Mississippi; and its leaves, instead of being quinate, are usually composed of six leafits. In neither place does it show any preference to marshy grounds, as the newly-proposed name, *palustris*, would seem to imply. Our course, inclining considerably towards the Missouri, made it necessary to leave the elevated region of the plains, and betake ourselves to the forests, soon after passing the Grand Prairie. In these forests the linden, the hop-horn beam, maple, beech, and ash, attain an uncommon magnitude. The blue beech (ostrya virginica) sometimes occurs, and is of a larger growth than in New England.

Extensive and very accessible beds of coal have been opened near Thrall's plantation. The inhabitants assert that, in sinking wells, the trunks of large trees have been met with at a great depth below the surface. We could, however, discover no satisfac-

* Willdenow. F. palustris. Nuttall.

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tory confirmation of this statement. The soil appeared to us to exhibit no evidence of having been disturbed at any period since the deposition of the coal beds and the accompanying sandstones.

On the 8th of June we arrived at Franklin. Here we delayed several days, in the expectation of receiving from Washington some further instructions, and the supply of funds necessary for the prosecution of the duties of the expedition. Having anxiously awaited one weekly arrival of the mail, and being disappointed of the expected communications, Major Long resolved to continue the journey, and to proceed in the accomplishment of the services assigned him, as far as the means then at his command would allow. As the great part of our proposed route to Council Bluff lay through the wilderness, we now thought it necessary to procure two horses, in addition to those we already had; one of them to be loaded with provisions, and the other for the use of a man whom we had engaged to accompany us.

We left Franklin on the 14th; and proceeding by a rugged and circuitous road across a tract of hilly forests, arrived at Charaton the same evening.

From Charaton to the mouth of Grand river, *the trace*, as the paths are here called, passes through a tract of low alluvial lands, partly covered with forests, but all extremely fertile. Here we were to take leave of the settlements, and to pursue the remainder of our journey through the wilderness; after dining in the cabin of a settler, we crossed Grand river, and betook ourselves to the course we thought proper to pursue, through a tangled and pathless forest. This brought us, after a few hours, to the border of an extensive plain. Our horses, somewhat unaccustomed to travelling in woods, and particularly the pack-horse, being young and untutored, gave us much trouble.

After ascending into the prairie, as the night came on, we were compelled to go a mile or two off

from our course, in search of water and wood for our encampment; at length finding a suitable place on the bank of a small stream, called Doe creek, discharging into Grand river, we kindled a fire, cooked, and ate our supper of bacon, pilot-bread, and coffee; and as we had no tent, spread our blankets under the shelter of a large tree, and laid ourselves down to rest. The hooting of owls, together with the howling of wolves, and the cries of other nocturnal animals, as we were yet unaccustomed to them, occasionally interrupted our slumbers. On the following morning, however, we found ourselves well refreshed, and were prepared to resume our journey at an early hour.

The road known by the name of Field's trace ascends from Charaton on the east side of Grand river about sixty miles, thence running nearly northwest through the immense plains of the Little Platte, the Nishnebottona, and the Mosquito river, to Council Bluff. At the mouth of Grand river we had learned that the eastern tributaries of that stream were much swollen, and were therefore difficult to cross; accordingly, we determined to ascend along the ridge between that river and the Little Platte, until we should fall in with the trace.

We were detained several hours in searching for a place where we might cross Doe creek. Though a very inconsiderable stream, its steep muddy banks were now almost filled, by the reflux occasioned by the freshet in the Missouri. It was not without great difficulty we at length effected a passage, at a point three miles distant from our encampment; thence directing our course by the compass, we travelled north, 45° west, twenty-two miles. In this distance we crossed three large creeks; two of them running eastward into Grand river, the other westward to the Wahconda.

In the plains we met with nothing to obstruct travelling. They had been perfectly denudated by

the burning of the last season; and the annual growth of grasses and weeds had as yet risen but about a foot from the ground. Among the grasses are intermixed great numbers of the legumina, with pinnated leaves; and these are so commonly canescent as to give their peculiar silvery colour to the whole plain. This effect is the more striking, when a slight breeze agitates the leaves of the numerous species of astragalus, psoralea, baptisia, and the beautiful amorpha canescens, all of which have their inferior surfaces beset with a shining silk-like down.

In the afternoon of the 14th a storm of rain commenced, which continued with little intermission for several days. Having no tent, we were much exposed to the weather; but at night we constructed a partial shelter, by stretching our blankets over the spot on which we lay down to rest.

As we approached the sources of Grand river, the country became more hilly. Horizontal limestone, like that about St. Louis, appears in the sides of the deep vallies.

In the scanty soils along these declivities the ferula fœniculacea sometimes occurs, diffusing its powerful and peculiar odour, perceptible after a shower at the distance of several rods.

18th. The rain of the preceding day continued with increased violence during the night. Our encampment was completely inundated, and the wind so high as to render our blanket-tent wholly useless. The small portfolio, in which we had deposited such plants as we wished to preserve, had been placed for a pillow in the most sheltered part of the tent, and covered with a coat; but these precautions, and all others we could adopt, were unavailing; and the collection of plants we had then made was lost.

Wishing to deviate as little as possible from the course we had assumed, and which we knew it was necessary to pursue, if we would follow the most

direct route to Council Bluff, we descended on the 19th, into a broad and densely wooded valley on our left. After crossing a part of this valley, through heavy forests of ash, sycamore, and cotton-wood, our progress was checked by a river of some magnitude, and so swollen and turbulent in consequence of the late rains, that we thought it advisable not to attempt the passage. We therefore relinquished our course; and being a long time detained in painful and fatiguing exertions to extricate ourselves from the forest, regained towards evening the open plain, and encamped.

We had now ascended about eighty miles from the mouth of Grand river. The country we had passed is fertile, and presents such an intermixture of forests and grassy plains, as is extremely pleasing to the eye. Towards the north the hills became gradually more and more elevated. The discontinuance of the horizontal limestone, the disclosure in the deep vallies of the more ancient varieties of sandstone, and the frequent occurrence in the soil of small round masses of granite, gneiss, and other primitive rocks, indicate an approach towards the margin of the secondary basin. In the deepest vallies, about the sources of Grand river, we observe a very hard semi-crystalline sandstone, in rather indistinct strata, and containing apparently few remains either of plants or animals. It is, in almost every respect, similar to that sandstone, which, in the valley of Lake Champlain, rests along the skirts of the granitic mountains of Ticonderoga, Crown Point, and Westport, and supports there a small stratum of compact limestone. Containing few fragments rounded by attrition, being almost destitute of cement, and retaining much uniformity of character in different localities, it has a manifest resemblance to that most ancient of sandstones, which, in the mountains of New England, is associated with the granular limestone, and has sometimes been called

granular quartz.* Indeed we have no hesitation in believing, that at some point near the sources of the De Moyen and Grand river, the primitive rocks approach near the surface. There is here a stratum of newer sandstone, superimposed upon that above noticed, and bearing marks of having been contemporaneous to some formation of coal; but it is not of sufficient thickness, in the parts we examined, to justify an opinion, that it contains any valuable beds of that mineral. Leaving the immediate neighbourhood of the river, there is an ascent of several miles to the level of the great woodless plain. The bottom, and part of the sides of the vallies, are covered with trees; but in proportion to the elevation, the surface becomes more unvaried and monotonous. These vast plains, in which the eye finds no object to rest upon, are at first seen with surprise and pleasure; but their uniformity at length becomes tiresome.

For a few days the weather had been fine, with cool breezes, and broken flying clouds. The shadows of these coursing rapidly over the plain, seemed to put the whole in motion; and we appeared to ourselves as if riding on the unquiet billows of the ocean. The surface is uniformly of the description, not inaptly called *rolling*, and will certainly bear a comparison to the waves of an agitated sea. The distant shores and promontories of woodland, with here and there an insular grove of trees, rendered the illusion more complete.

The great extent of country contemplated at a single view, and the unvaried sameness of the surface, made our prospect seem tedious. We pursued our course during the greater part of the day along the same wide plain, and at evening the woody point in which we had encamped on the preceding night was yet discernible.

* Eaton's Index to the Geology of the Northern States. First edition.

Nothing is more difficult than to estimate, by the eye, the distance of objects seen in these plains. A small animal, as a wolf or a turkey, sometimes appears of the magnitude of a horse, on account of an erroneous impression of distance. Three elk, which were the first we had seen, crossed our path at some distance before us. The effect of the *mirage*, together with our indefinite idea of the distance, magnified these animals to a most prodigious size. For a moment we thought we saw the mastodon of America, moving in those vast plains, which seem to have been created for his dwelling place. An animal seen for the first time, or any object with which the eye is unacquainted, usually appears much enlarged, and inaccurate ideas are formed of the magnitude and distance of all the surrounding objects; but if some well-known animal, as a deer or a wolf, comes into the field of vision so near as to be recognized, the illusions vanish, and all things return to their proper dimensions.

Soon after we had left our encampment, on one of the bright sunny mornings which occurred, when we were in the country near the sources of Grand river, we discovered, as we thought, several large animals feeding in the prairie, at the distance of half a mile. These, we believed, could be no other than bisons; and after a consultation respecting the best method of surprising them, two of our party dismounted; and creeping with great care and caution, about one-fourth of a mile through the high grass, arrived near the spot, and discovered an old turkey, with her brood of half-grown young, the only animals now to be seen.

On the evening of the 20th of May, we encamped in a low, muddy bottom, overgrown with nettles and phacelias; but the only place we could find combining the three requisites — grass for our horses, and wood and water for ourselves. Here we were so tormented by the mosquitoes, harassed and goaded by the wood-

ticks, that we were glad to seek relief by mounting our horses, at the earliest appearance of light on the following morning. The dew had been so heavy, that it was falling in drops from the grass and weeds where we had lain, and our blankets were dripping as if they had been exposed to a shower. We proceeded on our course about thirty miles, and encamped early in the afternoon. Having ascended Grand river nearly to the point, where we believed Field's trace must cross it, we directed our course more to the west, and had already crossed several streams running to the south, supposed to be the upper branches of the Little Platte.

The utmost uniformity prevails in the appearance of the country about the sources of the Little Platte, Nishnebottona, and other northern tributaries of the Missouri. Near one of these small rivers we discovered the trace of an Indian war party, which appeared to have passed very recently towards the Missouri. After our arrival at Council Bluff, we had farther information of these Indians, who were a war party of Sauks and Foxes from the Mississippi, and had committed many depredations upon the Missouri Indians, and some upon the whites. We were considered very fortunate in not having fallen in with them, as it was believed, they would not have hesitated to rob, and perhaps destroy, any party of whites as weak as ours.

Remains of bisons, as bones, horns, hoofs, and the like, are often seen in these plains; and in one instance, in a low swamp surrounded by forests, we discovered the recent track of a bull; but all the herds of these animals have deserted the country on this side of Council Bluff. The bones of elk and deer are very numerous, particularly about certain places, which, from the great number of tent poles, scaffolds, &c. appear to be old Indian hunting camps; and the living animals are still to be found here in plenty. As we rode along these boundless meadows,

every object within several miles became visible; the smallest shrub rising a few inches above the surface of the green expanse, could be seen at a mile distant.* Some large agarics, and a gigantic lycoperdon, peculiar to these regions, are the most conspicuous objects by which the uniformity of the plains is varied; and these may be seen sometimes at the distance of two or three miles.

On the evening of the 24th, we arrived on the bank of a beautiful river, at a grove of ash and cotton-wood trees. We had scarce dismounted from our horses, when a violent thunder-shower commenced; the rain fell in such torrents as to extinguish our fire, and the wind blew so violently that our blanket-tent could afford us no protection. Many large trees were blown down in the point of woods where we lay, and one fell a few yards from our camp. As the night was extremely dark, we thought the danger of moving at least equal to that of remaining where we were; and spent part of the night in the greatest anxiety, listening to the roar of the storm, and the crashing of the timber. As our horses were dispersed about the wood, we had scarce a hope they could all escape uninjured.

On the day following, after we had rode about eighteen or twenty miles, we observed the surface of the country to become suddenly hilly; and soon after were surprised by an unexpected view of the wide valley, the green meadows, and the yellow stream of the Missouri. A little after noon we encamped in a meadow on the river bottom, and by ascending one of the neighbouring bluffs; sufficiently elevated to overlook a large extent of the surrounding country, we were enabled to discover that we had arrived at the Missouri, at a point about

* A ceanothus, smaller than C. americana, the amorpha canescens, and the symphoria racemosa, are almost the only shrubs seen in the prairies.

six miles below the confluence of the great river Platte.

On the precipitous and almost naked argillaceous hills, which here bound the Missouri valley, we found the oxytropis lambertii, and the great flowering pentstemon; two plants of singular beauty. Here, also, we saw, for the first time, the leafless prenanthes, the yellow euchromia, and many other interesting plants. It would seem that several species of plants are distributed along the course of the Missouri, but do not extend far on either side. Probably the seeds of these have been brought down from their original localities, near the sources of the river. That the distribution of plants is sometimes effected in this way, there can be no doubt, as in the instance of the portulacca, with pilose leaves *, and other natives of the high and sandy plains of the Arkansa, which are sometimes found transplanted into the deep forests and fertile soils of the hilly region; but the agency of rivers in this respect appears much less important, than without particular examination, we might be inclined to imagine. In ascending the Missouri, the Arkansa, or any great river, every remove of forty or fifty miles brings the traveller to the locality of some plants, not to be seen below. This is perhaps less the case with rivers running from east to west, or from west to east, than with those whose course in a different direction, traverses several parallels of latitude.

On the 27th, we swam across Mosquito Creek; and after a ride of near thirty miles along the Missouri bottoms, encamped near the mouth of the Boyer, about six miles from the wintering place of the party. Early on the following morning we left our encampment, and were soon after cheered by the report of guns discharging at the Cantonment. The sight of the trading establishment, called Fort Lisa, gave us

* Nuttall's Travels into Arkansa, p. 165.

more pleasure than can easily be imagined, except by those who have made journies similar to ours, and have felt the deprivation of all those enjoyments which belong to the habitations of men. At ten A. M. we arrived at the Boyer, which Major Long immediately crossed on a small raft, leaving Captain Bell and Dr. James, with the horses and baggage, to wait until some soldiers could be sent out to assist in crossing. These arrived in a few hours; and before three o'clock we had crossed the Boyer and the Missouri, and found ourselves surrounded by our friends at Engineer Cantonment.

In the early part of June, 1820, arrangements were completed for the departure of the Exploring Expedition from their winter cantonment near Council Bluff. By an order of the Honourable Secretary of War, dated 28th February, Major Long had been instructed to explore the country from the Missouri westward to the Rocky Mountains; and thence, proceeding southward along the base of these mountains to the Arkansa, to despatch a division of his party down that river. The following orders were issued by Major Long, briefly sketching the proposed route, and assigning appropriate duties to each individual of the party.

" *Engineer Cantonment, Council Bluff,*
" *Orders.* *June* 1st, 1820.

" Agreeably to the instructions of the Honourable Secretary of War, the further progress of the Exploring Expedition up the Missouri is arrested during the present season. By the same authority, an excursion, by land, to the source of the river Platte, and thence by way of the Arkansa and Red rivers to the Missisippi, is ordered. The expedition will accordingly proceed on this duty as soon as practicable, and be governed by the order of the 31st March, 1819, issued at the United States' arsenal, near Pittsburgh, so far as it may be applicable. The duties therein assigned to Major Biddle will be per-

formed by Captain J. R. Bell, attached to the expedition by order of the war department, with the exception of those parts which relate to the manners, customs, and traditions of the various savage tribes which we may pass. The duties thus excepted will be performed by Mr. Say. The duties assigned to Dr. Baldwin and Mr. Jessup, by the order alluded to, will be performed by Dr. E. James, employed for these purposes, by the sanction of the secretary of war. In these duties are excepted those parts which relate to comparative anatomy, and the diseases, remedies, &c. known amongst the Indians; which will also be performed by Mr. Say.

"Lieutenant Graham will take charge of the United States' steam-boat, Western Engineer, and proceed down the Missouri to the Mississippi, with the remaining part of the crew originally attached to the boat, on the performance of duties assigned him by special order.

"The detachment from the rifle regiment, attached to the expedition, by order from the commanding officer of the 9th military department, will accompany the expedition in their route from this place to Belle Point, on the Arkansa, under the immediate command of Lieutenant Swift, who will inspect daily their arms and accoutrements, and report their condition to the commanding officer. He will receive such instructions from the commanding officer as occasion may require, in relation to the discharge of his duties.

"Guides, interpreters, hunters, and others attached to the expedition, will perform such duties as may be assigned, from time to time, by the commanding officer.

"The duties of the expedition being arduous, and the objects in view difficult of attainment, the hardships and exposures to be encountered requiring zealous and obstinate perseverance, it is confidently expected, that all embarked in the enterprize will

contribute every aid in their power, tending to a successful and speedy termination of the contemplated tour.

"S. H. LONG, *Maj. Engrs.*
Commanding Exploring Expedition."

The party, as now arranged, consisted of the following persons:

S. H. Long, Major, U. S. Topographical Engineers, commanding the expedition.

J. R. Bell, Captain Lt. Artillery,* to act as Journalist.*

W. H. Swift, assistant Topographer, commanding guard.

Thos. Say, Zoologist, &c.

E. James, Botanist, Geologist, and Surgeon.

T. R. Peale, assistant Naturalist.

Saml. Seymour, Landscape Painter.

Stephen Julien, Interpreter, French and Indian.

H. Dougherty, Hunter.

D. Adams, Spanish Interpreter.

Z. Wilson, Baggage Master.

Oakley and Duncan, Engagees.

Corporal Parish, and six privates of the U. S. army.

To these we expected an addition, on our arrival at the Pawnee villages, of two Frenchmen, to serve as guides and interpreters, one of them having already been engaged.

Twenty-eight horses and mules had been provided; one for each individual of the party, and eight for carrying packs. Of these, six were the property of the United States, being furnished by the commanding officer at Camp Missouri; the remaining sixteen were supplied by Major Long, and others of the party.

* It will be perceived, that in the following narrative no reference has been made to the notes or journal of Captain Bell, the reason of which is, that his journal, in the form of a report, was submitted to the Secretary of War, and consequently the compiler has had no opportunity of consulting it.

Our saddles and other articles of equipage, were of the rudest kind, being, with a few exceptions, such as we had purchased from the Indians, or constructed ourselves.

Our outfit comprised the following articles of provisions, Indian goods, &c. viz. 150lb. of pork, 500lb. of biscuit, 3 bushels of parched corn meal, 5 gallons of whiskey, 25lb. of coffee, 30lb. of sugar, and a small quantity of salt, 5lb. of vermilion, 2lb. of beads, 2 gross of knives, 1 gross of combs, 1 dozen of fire steels, 300 flints, 1 dozen of gun worms, 2 gross of hawk's bells, 2 dozen of mockasin awls, 1 dozen of scissors, 6 dozen of looking glasses, 30lb. of tobacco, and a few trinkets, 2 axes, several hatchets, forage-bags, canteens, bullet-pouches, powder-horns, tin cannisters, skin canoes, packing-skins, pack cords, and some small packing-boxes for insects, &c.

The gentlemen of the party were supplied with such instruments as were deemed indispensably requisite in their several pursuits. The instruments for topographical purposes were, three travelling, and several pocket compasses; one sextant, with radius of five inches; one snuff-box sextant; one portable horizon with glass frame and mercurial trough; one and a half pounds of mercury, in a case of box-wood; two small thermometers; several blank books, portfolios, &c.

The hunters, interpreters, and attendants, were furnished with rifles or muskets; the soldiers were armed exclusively with rifles, and suitably equipped. Our stock of ammunition amounted in all to about 30 pounds of powder, 20 pounds of balls, and 40 pounds of lead, with a plentiful supply of flints, and some small shot.

Several of the Indians about Council Bluff, to whom our proposed route had been explained, and who had witnessed our preparations, affected to laugh at our temerity, in attempting what they said we should never be able to accomplish. They represented some

part of the country, through which we intended to travel, as so entirely destitute of water and grass, that neither ourselves nor our horses could be subsisted while passing it. Baron Vasquez, who accompanied Captain Pike, in his expedition to the sources of the Arkansa, assured us there was no probability we could avoid the attacks of hostile Indians, who infested every part of the country. The assault which had been recently made by a party of the Sauks and Foxes, upon a trading boat belonging to Messrs. Pratte and Vasquez, on the Missouri, above Council Bluff, in which one man was killed, and several wounded, had at this time spread considerable terror among those in any degree exposed to the hostilities of the Indians.

With these prospects, and with the very inadequate outfit above described, which was the utmost our united means enabled us to furnish, we departed from Engineer Cantonment, at 11 o'clock, on the 6th of June.

The path leading to the Pawnee villages runs in a direction a little south of west from the cantonment, and lies across a tract of high and barren prairie for the first ten miles. At this distance it crosses the Papillon, or Butterfly creek, a small stream discharging into the Missouri three miles above the confluence of the Platte. Lieutenant Graham and Mr. J. Dougherty accompanied us about five miles on our way; we were also met by Lieutenant Talcott from Camp Missouri, who crossed the bluffs on foot, to take leave of us. Much delay was occasioned, as we passed along, by the derangement of the packs, the obstinacy of the mules, and the want of dexterity and experience in our engagees; we however arrived early in the afternoon at the Papillon, where we encamped.

The Papillon, although it traverses a considerable extent of country, was at this time but a trifling stream. Its channel is narrow, the banks steep, and

like many other streams which have their whole course in these arid plains, it is nearly destitute of water, except in rainy seasons.

During the night some rain fell, but as we were furnished with three tents, sufficiently large to shelter all our party, we experienced little inconvenience from the storm. Our baggage was also effectually protected, being laid in heaps, and covered with bear-skins; which were also spread over it when placed upon the pack-horses, during our march by day.

We had each two small blankets, which were carried upon four horses, one being placed under the saddle, and the other upon it. These, with the addition, in some instances, of a great coat, or a blanket-capot, and a valise or a pair of holsters, to supply the place of a pillow, were our only articles of bedding.

On morning of the 7th, a new disposition was made, in relation to the pack-horses, a man being appointed to attend particularly to each. We breakfasted, and re-commenced our journey at an early hour, and moving forward at an easy pace, arrived about ten o'clock at the Elk-horn, a considerable river, tributary to the Platte. On the preceding evening, we had been joined at our camp by a party of three or four Frenchmen, on their way to a hunting camp of the Omawhaws to trade. We purchased of them two small brass kettles, to complete our supply of camp furniture. One of these men had been of Pratte and Vasquez's party, at the time of the late attack, and had received, in that affair, a wound in the back from a rifle ball, which was yet unhealed. In the morning they accompanied us to the Elk-horn, where the wounded Frenchman was one of the first to strip and plunge into the river. Surprising accounts are given of the hardihood, and patience under suffering, manifested by the Indians; but we have rarely seen one of them

exhibit a more striking instance of insensibility to pain, than this Frenchman.

The Elk-horn, called Wa-ta-tung-ya by the Otoes, is, where we crossed it, about thirty yards wide, and during a great part of the year, too deep and rapid to admit of being forded. At this time our horses were barely able to keep their feet, in crossing the deepest part of the channel. Our heavy baggage was ferried across in a portable canoe, consisting of a single bison hide, which we carried constantly with us. Its construction is extremely simple; the margin of the hide being pierced with several small holes, admits a cord, by which it is drawn into the form of shallow basin. This is placed upon the water, and is kept sufficiently distended by the baggage which it receives; it is then towed or pushed across. A canoe of this kind will carry from four to five hundred pounds. The squaws, who are exceedingly expert in this sort of navigation, transport not only their baggage, but their children, and sometimes adults, across large rivers, in these canoes, and with the most perfect safety. They place their children on the baggage, and convey the whole across the stream, by swimming themselves, and urging their charge before them to the opposite shore. It is rare that any unpleasant accident occurs in this primitive mode of ferrying.* The Elk-horn enters the Platte about fifty miles above the confluence of that river and the Missouri. Its whole course is through a country nearly destitute of timber. The low plains

* In Father Venegas' account of California, published at Madrid in 1758, we find a description of a similar method of transportation, used by the natives of that country. "The inhabitants of the banks of the Colorado make of the same herbs (a vine called Pita,) little tubs or bins, called Coritas, which generally hold about two bushels of maize; and in these they transport their goods from one shore to the other, without being in the least damaged by the water, they themselves swimming behind, and shoving these vehicles along before them." Vol. i. p. 44. London, 1759.

which extend along its banks have a fertile soil; but the want of timber opposes a serious obstacle to their settlement.

The soil and climate here are so entirely similar to those of the country about Grand river and the Little Platte, already described, that no change in the vegetable productions could be expected. A species of onion, with a root about as large as an ounce ball, and bearing a conspicuous umbel of purple flowers, is very abundant about the streams, and furnished a valuable addition to our bill or fare.

Soon after crossing the Elk-horn we entered the valley of the Platte, which presented the view of an unvaried plain, from three to eight miles in width, and extending more than one hundred miles along that river, being a vast expanse of prairie, or natural meadow, without a hill or other inequality of surface, and with scarce a tree or a shrub to be seen upon it. The woodlands, occupying the islands in the Platte, bound it on one side; the river-hills, low and gently sloped, terminate it on the other.

At about three o'clock, P. M., a party of ten Indians were seen crossing the plain, towards the Platte, at a great distance before us. Soon after we arrived at a small creek, where was some scattered timber: here we determined to halt for the night, being informed by our guide that we would meet with no wood for twenty miles beyond.

As Indians had been seen in the afternoon, and we were aware of their being still in our neighbourhood, it was thought proper to stake the horses as near as possible to the camp, and to station two sentinels, who were to be relieved during the night.

In our encampment we observed the following order. The three tents were pitched in a right line, all fronting in the same direction. In advance of these, at the distance of four feet, our baggage was arranged in six heaps, one at the right, and one at the left of the entrance to each tent, and protected from

the weather by bear-skins thrown over them. This disposition was made, not only for the convenience of the party, but that our baggage, in case of an attack of the Indians, might serve as a kind of breast-work, behind which we might be, in some measure, sheltered from danger. At any rate, having our baggage thus arranged, we should know where to find it, and where to rally, in any emergency by day or night.

On the ensuing morning, (8th,) we continued our journey along the north side of the valley of the Platte, at the distance of four or five miles from the river, the direction of our course south, 85° west, which we followed near twenty miles.

In all our marches we observed the following order. Capt. Bell, mounted on a horse whose gate was regular and uniform, and well calculated for the estimation of distances, preceded the party, attended by our guide. — The soldiers and attendants, formed into two squads, for the better management of the pack-horses, followed in single file. — The scientific gentlemen occupied any part of the line that best suited their convenience. — Major Long followed in the rear, for the purpose of superintending the readjustment of deranged packs, and urging any disposed to linger, to the observance of a close order of march, a duty attended with no inconsiderable trouble and perplexity. Though our route lay at the distance of several miles from the Platte, we could distinctly see the narrow and interrupted line of timber which grows along its course, and occasionally we had a transient view of the river itself, spreading like an expansive lake, and embosoming innumerable islands. About eighteen miles from our encampment, our course led us into the valley of a small river, called La petite Coquille or Muscleshell Creek, which we ascended six miles, not deviating from the course we had taken. In the middle of the day we encountered a violent thunder-storm without dis-

mounting from our horses. The plain about us, for a great distance, was destitute of timber, and so level that our party formed the most prominent object in an extent of several miles. It is not surprising that, in this situation, we were a little startled at seeing the lightning strike upon the ground at the distance of two hundred yards from us. We could not have been deceived, in relation to this appearance, as we distinctly saw the water and mud thrown several feet into the air by the shock. The storm was so violent that, notwithstanding all our care, we could not prevent our baggage from being wet. We crossed the Coquille six miles above the place where it enters the valley of the Platte. This we effected with some difficulty, the banks being steep and muddy, and immediately afterwards encamped to dry our baggage.

The Coquille is about eight yards across; its bed muddy, and the current moderate. Its course is circuitous, traversing some inconsiderable tracts of fertile and well wooded bottom land: in one of these our camp was placed. The night was warm and the mosquitoes swarming in inconceivable multitudes.

Our baggage had been wet on the preceding day, and again by a heavy shower in the night: as the morning was cloudy, we remained in camp for some time, and attempted to dry our clothes and blankets by a large fire. After breakfasting we again got upon our horses, and, travelling nearly south-west, arrived in the afternoon at the valley of the Wolf river, or Loup fork of the Platte. This river is called by the Indians the Little Missouri, on account of its resemblance, in the velocity of its current, the turbidness of its waters, and other respects, to that river.

Its sources are in the country of the Poncaras, opposite those of the Quicurre.* Like the Platte, its

* See Lewis and Clarke, vol. i p. 67.

immediate valley is a broad and woodless plain, almost without any perceptible unevenness of surface, and bounded on each side by parallel ranges of low and barren hills.

During our ride, as we were approaching the Loup fork, we met two Pawnee Indians, handsomely mounted, and, as they informed us, on their way to dance the calumet dance with the Omawhaws. We gave them a small quantity of tobacco, and they departed, appearing highly pleased. In the fertile grounds, along the valley of the Loup fork, we observed several plants which we had not before seen: among these was one belonging to the family of the malvaceæ, with a large tuberous root which is soft and edible, being by no means ungrateful to the taste.* We observed also the downy spike of the rabbit's-foot plantain (plantago lagopus, Ph.) intermixed with the short grasses of the prairie. The long-flowered puccoon, (batschia longiflora, N.) a larger and more beautiful plant than the B. canescens is here frequent. As we proceed westward, some changes are observed in the character of the soil and the aspect of vegetation. The larkspurs and lichnedias, (species of phlox and delphinium, so common and beautiful in all the country between St. Louis and Council Bluff, are succeeded by several species of milk vetch, [3] some vicias, and the superb sweet pea (lathyrus polymorphus). Every step of our progress to the west brought us upon a less fertile soil. We had as yet seen no game except a few antelopes, too wild and watchful to be taken without much trouble. In the low prairies we saw several curlews and marbled godwits, with their young; Bartram's sandpiper was also very frequent.

* This plant is destitute of the exterior calyx of the genus malva, to which, however, it is more closely allied than to sida, into which it would appear to fall by its artificial characters. It appears to be a congener to the two new plants lately brought by Mr. Nuttall from Arkansa, and which have received the name of *Nuttallia*.

A little before sunset we crossed Grape Creek, a small and rapid stream of clear water, and soon after arrived at the Loup fork, where we encamped. The banks of this river are of a fine white sand, and are elevated no more than about eight feet above the surface of the stream, at a time of low water. It does not however appear that the low plains, contiguous to the Loup fork, are at any season inundated, the channel being sufficiently wide, and the current rapid enough to discharge all the water, which may at any time be brought down from above.

In the evening, and on the following morning, observations were taken to ascertain the magnetic variation, which was found to be 13½° east.

On the morning of the 10th, we crossed Beaver Creek, six miles south-west of our encampment. Here we were conpelled to carry across our baggage by hand, the creek being too deep and muddy to admit risking it on the pack-horses.

In fording this difficult stream, we had the misfortune to lose an important part of the lock of an air-gun, and as there were no means of replacing the lost article, it was determined to send back the gun from the Pawnee villages by one of the traders, who was soon to return to the Missouri.

While we were encamped at this spot, being detained by a heavy shower, three Frenchmen and two Indians, arrived at the ford, on their way to the Pawnee villages. They told us they had eaten nothing since they left the Missouri. One of the Frenchmen brought a letter from Lieutenant Graham, and a box containing a quantity of vaccine virus, transmitted to the exploring party, for the purpose of introducing vaccination among the Indians. The The box alluded to had been sent to the war department, by Mr. Sylvanus Fancher, a gentleman in Connecticut, and forwarded to the commanding officer of the expedition. It contained a consider-

able quantity of virus, carefully enclosed in a variety of packing apparatus, together with instructions relative to the disposition and application of it. But as it was not transmitted till after the departure of the expedition from Pittsburgh, it had been forwarded by mail to St. Louis, whence it was conveyed up the Missouri, by a gentleman of the military expedition, under Colonel Atkinson. Unfortunately, the keel-boat, on board of which it had been deposited, was wrecked in ascending the river, and the box and its contents, although saved from the wreck, was thoroughly drenched, and the virus completely ruined. It was received three or four weeks after the catastrophe just mentioned, and was still drenched with water.

The Frenchmen had, on their way, caught a horse belonging to Mr. J. Dougherty, and intended for the use of his brother, who was of our party. He had escaped several weeks previous, from Engineer Cantonment, and since that time had been wandering in the prairies. This formed a valuable addition to our stock of horses, as a number of them were already unfit for service, on account of sore backs.

The Frenchmen and Indians were supplied with provisions from our packs, and proceeded immediately on their way, intending to reach the Pawnee villages the same evening.

At a late hour in the afternoon we resumed our journey, and at the distance of four miles from Beaver Creek, crossed the Creek of Souls, a small and muddy stream, in which two of the pack-horses fell, again wetting our baggage.

At sunset we arrived at a small creek, eleven miles distant from the village of the Grand Pawnees, where we encamped.

On the following morning, having arranged the party according to rank, and given the necessary instructions for the preservation of order, we proceeded forward, and in a short time came in sight of

the first of the Pawnee villages. The trace on which we had travelled since we left the Missouri, had the appearance of being more and more frequented as we approached the Pawnee towns; and here, instead of a single footway, it consisted of more than twenty parallel paths, of similar size and appearance. At a few miles distance from the village, we met a party of eight or ten squaws with hoes and other instruments of agriculture, on their way to the corn plantations. They were accompanied by one young Indian, but in what capacity, whether as assistant, protector, or task-master, we were not informed. After a ride of about three hours, we arrived before the village, and despatched a messenger to inform the chief of our approach.

Answer was returned that he was engaged with his chiefs and warriors at a medicine feast, and could not, therefore, come out to meet us. We were soon surrounded by a crowd of women and children, who gazed at us with some expressions of astonishment; but as no one appeared to welcome us to the village, arrangements were made for sending on the horses and baggage to a suitable place for encampment, while Major Long, with several gentlemen, who wished to accompany him, entered the village.

The party which accompanied Major Long, after groping about some time, and traversing a considerable part of the village, arrived at the lodge of the principal chief. Here we were again informed that Tarrarecawaho, with all the principal men of the village, were engaged at a medicine feast.

Notwithstanding his absence, some mats were spread for us upon the ground, in the back part of the lodge. Upon these we sat down, and after waiting some time, were presented with a large wooden dish of hominy, or boiled maize. In this was a single spoon of the horn of a bison, large enough to hold half a pint, which, being used alternately by each of the party, soon emptied the dish of its contents.

The interior of this capacious dwelling was dimly lighted from a hole at the top, through which the sun's rays, in a defined column, fell aslant upon the earthern floor. Immediately under this hole, which is both window and chimney, is a small depression in the centre of the floor, where the fire is made; but the upper parts of the lodge are constantly filled with smoke, adding much to the air of gloominess and obscurity which prevail within. The furniture of Long Hair's lodge consisted of mats, ingeniously woven of grass or rushes, bison robes, wooden dishes, and one or two small brass kettles. In the part of the lodge immediately opposite the entrance, we observed a rude niche in the wall, which was occupied by a bison skull. It appeared to have been exposed to the weather, until the flesh and periosteum had decayed, and the bones had become white.

In this lodge we saw a number of squaws of different ages, but all, as we supposed, the wives of Long Hair. This chief, who is somewhat of a Turk in his domestic establishment, has eleven wives, nine of whom are quiet occupants of the same lodge. He has but ten children.

Our visit to this village seemed to excite no great degree of attention. Among the crowd, who surrounded us before we entered the village, we observed several young squaws rather gaily dressed, being wrapped in clean and new blankets, and having their heads ornamented with wreaths of gnaphalium, and the silvery leaves of the prosalea canescens. On the tops of the lodges we also saw some display of finery, which we supposed to have been made on account of our visit. Flags were hoisted, shields, and bows, and quivers, were suspended in conspicuous places, scalps were hung out; in short, the people appeared to have exposed whatever they possessed, in they exhibition of which they could find any gratification of their vanity. Aside from these, we received no distinguished marks of attention from the Grand Pawnees.

After spending an hour or two at their village, we retired to our camp about a mile distant. Here we were shortly afterwards visited by Long Hair, the Malicious chief, and several others. They had with them a young Spaniard, who interpreted Pawnee and French, by whose means we were able to communicate freely with them. They offered some apology, for not receiving us at their village, saying, they could not have left their medicine feast, if the village had been on fire. We caused our intended route to be explained to them, with the objects we had in view, in undertaking so long a journey. To this they answered, that our undertaking was attended with great difficulty and danger; that the country about the head of the Platte was filled with bands of powerful and ferocious Indians, who would lose no opportunity to attack and injure us; that in some parts of our route, we must suffer from want of water, in others there was no game. "In short," said the Grand chief, "you must have long hearts, to undertake such a journey with so weak a force; hearts that would reach from the earth to the heavens." These representations would, it is probable, have had some effect upon our spirits, had we not supposed they were made entirely for that purpose. The Pawnees undoubtedly hoped to alarm our fears to such a degree, that we should be induced to relinquish our proposed journey; their design being to deter us from passing through their hunting grounds, and perhaps hoping by these means to possess themselves of a larger share of the articles we had provided for Indian presents.

Finding our determination was not to be shaken, they advised us to ascend the Loup fork, instead of taking the route by the Platte, which we had mentioned. This advice, and the statement by which it was accompanied, that there were no bisons on the Platte, we suspected of originating from the same motive which had induced them to make the re-

presentation above mentioned; it was not, therefore, allowed in any manner to influence our determination.

After collecting from them what information we could obtain, relative to the country to the west, we endeavoured to dismiss them with some presents. They were not, however, easily to be satisfied — they importuned us for tobacco, and other articles, which the limited nature of our supplies would not allow us to give, as we expected soon to meet with Indians, whose good will it would be more important for us to purchase.

Our camp was something more than a mile from the village. The intervening space, as well as the plain for a great extent on all sides, was covered with great numbers of horses, intermixed with men, women, and children. The men having no serious business, pass much of their time in the open air, either on horseback, or engaged at some game of hazard.

The Pawnees are expert horsemen, and delight in the exhibition of feats of skill and adroitness. Many of their horses are branded, but this is the case with such only as are taken in their predatory excursions against the Spaniards of New Mexico, or the south-western Indians; the branded horses all come originally from the Spaniards. It does not appear that the Indians have any method of affixing distinctive marks to their animals. Each Indian has usually but a very limited number of horses, which are as well known, and as universally acknowledged to be his, as the children or other members of his family. Some of the finest horses which we observed, were ornamented with gaudy trappings, and furniture of Spanish manufacture.

We spent some time in attempting to explain to the chiefs the nature and effects of the vaccine disease, and in endeavouring to persuade them to influence some of their people to submit to inoculation;

but in this we were unsuccessful. It is now several years since the ravages of the small pox have been experienced among them, and it is probable they feel an undue degree of security against its future visitations. We were, however, by no means confident that they comprehended what we said on the subject of vaccination; if they did, it is not probable their confidence in us was sufficient to induce them to receive it as truth. All we were able to effect, was to persuade the young Spanish interpreter to allow us to make use of his arm, to show the Indians that the proposed operation was by no means a formidable one. With the same intention, the operation was performed upon Major Long's arm, and that of Mr. H. Dougherty.

We were not very solicitous to make the experiment among them, our virus, as before remarked, being unfit for use. We were accordingly afraid of impairing their confidence in the remedy.

In the plain about the village, we noticed several little groups of squaws, busily engaged in dressing the skins of the bison for robes. When the processes of tanning and dressing are completed, and the inner surface of the skin dry, figures are traced upon it with vermilion, and other showy colours.

These are designed as ornaments, but are sometimes a record of important facts. The story of a battle is often depicted in this way, and the robe of a warrior is frequently decorated with the narration, in pictures, of some of his exploits.

During the afternoon our camp was somewhat thronged by the Indians, offering to trade horses, and squaws proposing barters, but at night they withdrew towards their village, and all remained quiet.

As the day began to dawn on the following morning, numerous parties of squaws, accompanied by their dogs, were seen on their way from the village to the corn patches, scattered at the distance of several miles.

At sunrise we mounted our horses, and arranging ourselves as on the preceding day, and carrying a white silk flag with a painted design, emblematic of peaceable intentions in the front, and the United States' flag in the centre of our party, we moved forward towards the second village, distant about three miles from our camp.

The bands which inhabit this village, are called Republican Pawnees. This name, it is said, has been applied to this band, in consequence of their having seceded from the parent stock or Grand Pawnees, some years since, and established themselves under a separate government.

They resided formerly on the Republican fork of the Konzas river, to which they have given their name; whence they removed a few years since to their present situation, that they might enjoy the protection of their more powerful allies, the Grand Pawnees. Their village is distant four miles from that of the Grand Pawnees, and like it on the immediate bank of the river. Fool Robe, their chief, received us with a little more attention than we had met on the preceding day, shaking us each by the hand. He afterwards conducted us to his lodge, within the village, but excused himself from feasting us, saying, his squaws were all absent at the corn fields.

It was a war party from this band which had plundered the detachment from the steam-boat on the preceding summer near the Konza village. For this outrage they had been compelled, by the prompt and vigorous interference of Major O'Fallon, the Indian agent, to make ample restitution. Whether it was that Fool Robe and his warriors were yet a little sore on account of this affair, or for some other reason, it was evident we were not welcome visitants. We had hitherto entertained exalted ideas of the hospitality of the Pawnees in their manner of receiving strangers, and were consequently a little

disappointed at the reception we had met. We stayed but a short time with Fool Robe. Having briefly described to him the outline of our intended journey, and listened to his remarks and advice respecting it, we remounted our horses, and proceeded towards the Loup village.

On our way we were met by the Knife-chief, who, having heard of our intention to visit him, came out on horseback, and met us more than a mile from the village. He gave us a very cordial and friendly reception, frequently rubbing his breast in token of the satisfaction he felt at seeing us. His frank and intelligent countenance, and his impressive gestures, made him easily understood, without the aid of an interpreter. As our cavalcade passed by him, he appeared to examine, with some attention, the physiognomy and appointments of the individuals composing it; but when his rapid eye alighted upon Julien, with whom he could use much freedom, he rode up to him, and eagerly inquired, by means of signs, (v. Nos. 27. and 14. in the Appendix,) if we had brought with us any whiskey, which we were grieved to learn, by this intimation, that he was acquainted with, and would indulge in; Julien replied in the negative, by the exhibition of the proper sign, (No. 65.) with which he did not betray any dissatisfaction, although it was evident from his subsequent conversation that he believed it to be false. On the way to the village he pointed out a convenient place for us to dispose of our horses and establish our camp. Here we dismounted, leaving our horses in the care of the guard, and followed the chief to his lodge. Soon after our arrival a large dish was placed before us, according to the custom of the Indians, filled with boiled sweet corn. While we were eating, the Knife-chief, with the principal men of his nation, were sitting silently behind us. Having finished our repast, we gave the Indians an account of ourselves, the occasion of our visit to

them, our intended journey to the mountains at the head of the Platte, &c. as in the other villages. To all this the Knife-chief listened with great attention. He expressed himself satisfied with the account we had given of the objects of our enterprize, but feared we should be ill treated by the savages we should meet. "Your heart must be strong," said he, "to go upon so hazardous a journey. May the Master of Life be your protector." The same benediction had been given us by the chiefs of the Republican and Grand Pawnees, probably with nearly the same degree of ingenuousness and sincerity. The Pawnees are at war with the Arrapahoes, Kaskaias, and other erratic bands, who wander about the sources of the Platte and Arkansa. Their war parties are often sent out in that direction, where they sometimes meet a spirited reception from their enemies. It may be on this account that the Pawnees connect the idea of imminent danger to an excursion into those parts of the country which we proposed to visit. It is, however, highly probable their unwillingness to have us pass through their hunting grounds was the most productive cause of all the anxiety, and all the fears they expressed on our account.

The chief addressed us for some time with great apparent earnestness, but his discourse, as it came to our comprehension by the aid of an interpreter, whom we obtained at this village, seemed directed solely to one object, the exciting our compassion for his poverty.

"Father, — You see me here; I am very poor; my young men are very poor; we hope our Great Father will not forget the red skins, his children, they are poor;" with a great deal more in the same strain. He, however, returned frequently to the subject of our journey to the west. "I will tell my young men," said he, (meaning the war parties which should be sent out in that direction,) "when

they meet you, to take you by the hand, and smoke the peace pipe with you."

The Knife-chief, with his son Petalesharoo, celebrated for his filial affection, his valour, and his humanity, visited us at our camp in the afternoon, and we were proud to entertain one whom we thought so worthy of our admiration. We also received a visit from a *Medicine-man*, who, having heard there were great medicine men belonging to our party, requested to be shown some of the mysteries of their profession. We accordingly displayed before him a pair of bullet-forceps, a small case of surgeons' instruments, and some similar articles, and began to explain to him the use of each. He attended for some time to our discourse, but apparently without comprehending any part of it, and at length turned abruptly away, with an air of dissatisfaction and contempt.

The Canadian, who had been engaged before we left the Missouri as a guide, now gave us to understand that it was not his intention to accompany the expedition. Having been informed of other persons in the village who were qualified for this undertaking, Major Long made application to several of these, who at first expressed a willingness to accompany him, but soon afterwards recalled their promises. Finding them disposed to trifle in this manner, he at length assured them that, unless some one was immediately procured to attend the expedition as guide, their refusal, and the breach of engagement on the part of Bijeau, should be made known to the agent, and the whole corps of Canadian traders be deprived of the privilege of residing, or trading among the Pawnees. This representation had the desired effect. A ludicrous degree of consternation and alarm was depicted upon the faces of all the traders, and they immediately made a common concern of a subject which before they had treated with very little attention. Two were immediately se-

lected from their number, and were in a short time ready to attend us. It is probable almost any other method of punishment would have appeared to them less terrible. Having been long resident among the Indians, they have conformed to their mode of life, which certainly is not without its charms to the uninformed and the idle. A tie not less powerful is that of conjugal and paternal affection, they having among the Indians wives and children relying upon their exertions for protection and maintenance.

About the village we saw several parties of young men eagerly engaged at games of hazard. One of these, which we noticed particularly, is played between two persons, and something is staked on the event of each game. The instruments used are a small hoop, about six inches in diameter, which is usually wound with thongs of leather, and a pole, five or six feet long, on the larger end of which a limb is left to project about six inches. The whole bears some resemblance to a shepherd's crook. The game is played upon a smooth beaten path, at one end of which the gamester commences, and running at full speed, he first rolls from him the hoop, then discharges after it the pole, which slides along the path, pursuing the hoop, until both stop together, at the distance of about thirty yards from the place whence they were thrown. After throwing them from him, the gamester continues his pace, and the Indian, the hoop, and the pole arrive at the end of the path about the same time. The effort appears to be to place the end of the pole either in the ring, or as near as possible; and we could perceive that those casts were considered best when the ring was caught by the hook at the end of the pole. What constitutes a point, or how many points are reckoned to the game, we could not ascertain. It is, however, sufficiently evident that they are desperate gamesters, often losing their ornaments, articles of dress, &c. at play.

This game, like some of those described in a former part of this work, requires considerable exertion, and is well calculated for the exhibition of that gracefulness of figure, and that ease and celerity of motion in which the savages so far surpass their civilized neighbours. We saw many young men engaged at these diversions, who had thrown aside their robes, leggins, and all superfluous articles of dress, displaying a symmetry of proportion, and beauty of form, which we have rarely seen surpassed. They were so intent upon their diversion, that in some instances our approach towards them, as we were rambling about the village, did not for a moment call off their attention from the game.

The population of the three Pawnee villages was estimated by Captain Pike, in 1806, at 6,223, and they were at that time supposed to be able to call into the field 1,993 warriors. At present it is believed they would fall short of this estimate, particularly in the number of warriors. They are, however, still numerous, and are said to be increasing, and are respected by the Sioux, and other neighbouring nations, as warlike and powerful.

About the three villages are six or eight thousand horses, feeding in the plains during the day, but confined at night. These, with a breed of sharp-eared, meagre, wolf-like dogs, are their only domestic animals. On the approach of winter they conceal their stores of corn, dry pumpkins, beans, &c. and with their whole retinue of dogs and horses desert their villages. This they are compelled to do from the want of wood, not only for fuel, but for the support of their numerous horses.

They encamp in their lodges of skins wherever the cotton wood is found in sufficient quantities for their horses, and game for themselves. The horses, in the country bordering the Missouri, are fed during the winter, in the extensive wooded bottoms of that river, and are not, therefore, confined exclusively to

the cotton wood, having access to other timber, also to the rushes and coarse grass which abound in the bottoms. We are, however, well assured that the Indian horses, farther to the west, about the upper branches of the Platte, and Arkansa, subsist and thrive during the winter, with no other article of food than the bark and branches of the cotton wood. The winter at the Pawnee villages is said to be uncommonly severe, but is probably little, if any more so, than at Council Bluff, on the Missouri. Thermometric observations at Council Bluff, and at St. Peters on the Mississippi, prove that the climate at these two places does not very widely differ from that of the corresponding latitudes on the Atlantic coast, except that it is at times something colder. The vicissitudes of temperature appear to be equally great and sudden.

The climate at Council Bluff is beyond the influence of the south-western winds from the Gulf of Mexico, which have been supposed to have so perceptible an effect to soften the rigours of winter in the valley of the Lower Mississippi. The three Pawnee villages, with their pasture grounds and insignificant enclosures, occupy about ten miles in length of the fertile valley of the Wolf river. The surface is wholly naked of timber, rising gradually to the river hills, which are broad and low, and from a mile to a mile and an half distant. The soil of this valley is deep and of inexhaustible fertility. The surface, to the depth of two or three feet, is a dark coloured vegetable mould intermixed with argillaceous loam, and still deeper, with a fine sileceous sand. The agriculture of the Pawnees is extremely rude. They are supplied with a few hoes by the traders, but many of their labours are accomplished with the rude instruments of wood and bone which their own ingenuity supplies. They plant corn and pumpkins in little patches along the sides of deep ravines, and wherever by any accident the grassy

turf has been eradicated. Sometimes these little plantations are enclosed with a sort of wicker fence, and in other instances are left entirely open. These last are probably watched by the squaws during the day time, when the horses run at large.

We slept on the night of 12th at our encampment in front of the Pawnee Loup village. During the night all remained at rest except the dogs, who howled in concert, in the same voice, and nearly to the same tune, as the wolves, to whose nightly serenade we were now accustomed.

As soon as the day dawned we observed the surrounding plain filled with groups of squaws, with their small children, trooping to their cornfields in every direction. Some, who passed our encampment, lingered a moment to admire our novel appearance; but the air of serious business was manifest in their countenances, and they soon hurried away to their daily labours. Some of the groups of young females were accompanied by a jolly looking young man as a protector. Their corn is usually gathered before it is entirely ripe, it is then boiled, cut from the cob, and dried. Their cookery consists in boiling it, either with or without the tallow of the bison, according to the state of their supplies. The pumpkins are cut in slips, which are dried in the sun, and afterwards woven into mats for the convenience of carrying. They offered us these articles in exchange for tobacco, vermillion, beads, looking-glasses, and various other trinkets. Also jerked bison beef, and the tallow of that animal, of which we purchased a small quantity. We saw among them the *pomme blanche*, as called by the Canadian traders and boatmen, which is the root of the Psoralea *esculenta*. It is eaten either boiled or roasted, and somewhat resembles the sweet potatoe.

At ten o'clock, on the morning of the 13th, we commenced crossing the river, opposite the village. This we found an undertaking of some difficulty, as

the current was rapid, and the bottom partook something of the nature of quick-sands. Major Long, Mr. Say, and one or two others, who were riding at the head of our line, had nearly crossed, and were wading their horses about mid-sides deep in the water, when they were suddenly thrown from their saddles by the sinking of their horses' feet in the sand; the horses, however, extricated themselves by their own exertion; and those of the party who had experienced this unexpected immersion, were greeted, upon their standing up in the water, by the shouts and acclamations of the Pawnees who lined the shore we had left. Major Long's gun and jacob-staff, as well as Mr. Say's gun, blanket, and other articles, were dropped into the river; all of these were, however, recovered except the blanket; and Mr. Say, having lost the greater part of his furniture at the river of Souls, by the ill-timed activity of his horse, was now, in a great measure, unencumbered with baggage. At length, by leading our horses, we arrived in safety on the opposite shore, where we encamped, intending to make some further barters with the Pawnees, and to dry some of our baggage, guns, &c. which had been wet in crossing.

The sand of this river, which in the aggregate, has a very white appearance, consists principally of minute grains of transparent quartz, mixed with some which are red, yellow, and variously coloured. The shore, opposite the Loup village, is covered with shrubs and other plants, growing among the loose sands. One of the most common is a large flowering rose, rising to about three feet high, and diffusing a most grateful fragrance. The Symphoria *glomerata*, common in all the country west of the Mississippi thus far, is also a beautiful shrub very frequent at this place; the flowers are white, with a faint and delicate tinge of red, having the inside of the corolla densely villous, like the Mitchilla, to which plant it is manifestly allied. On the hills, at

a little distance from the river, we observed the *Cactus fragilis.* This plant, which was first detected on the Missouri by Lewis and Clark, has been accurately described by Mr. Nuttall. The articulations or joints of which it consists, are small, oblong, and tapering, but separate from each other with great readiness, and adhere by means of the barbed spines, with which they are thickly set, to whatever they may happen to touch. This has led to a saying among the hunters, that the plant grows without roots.

In the afternoon a young Indian belonging to the Arikara nation on the Missouri, but who resided among the Pawnees, stopped at our camp, on his return from a solitary excursion to the Arkansa. He had brought with him, from one of the upper branches of that river, two masses of salt, each weighing about thirty pounds. This salt is pure and perfect, consisting of large crystalline grains, so concreted together as to form a mass about twenty inches in diameter and six in thickness. It had evidently been formed by the evaporation of water in some pond or basin, and that surface of the mass, which was its lower in its original position, was intermixed with red sand, indicating the sort of soil in which it is found. Mr. Peale procured some specimens in exchange for tobacco.

This Indian had been many days absent, on his excursion, and as he sat upon his horse before our encampment we had an opportunity to note a trait in the Indian character, which has been the subject of remark by many authors, and which we had previously observed in several instances ourselves; we allude to the apparent coolness which friends, and and the nearest relatives, observe to each other when they meet after a long separation. Several of his fellow townsmen, who were about our encampment, hardly noticed him when he first appeared, and it was only after the lapse of a considerable interval

that one of them spoke to him, but without any visible ceremony of greeting.

On the morning of the 14th, we left our encampment, opposite the village of the Pawnee Loups, and proceeded on our journey, taking the most direct course towards the Platte. Our party had here received an addition of two men, one named Bijeau, engaged as guide and interpreter, the other, Ledoux, to serve as hunter, farrier, &c. Both were Frenchmen, residing permanently among the Pawnees, and had been repeatedly on the head waters of the Platte and Arkansa, for the purpose of hunting and trapping beaver. Bijeau was partially acquainted with several Indian languages; in particular, that of the Crow nation, which is extensively understood by the western tribes, and, by frequent intercourse with the savages he had gained a complete knowledge of the language of signs, universally current among them. The great number, and the wide dissimilarity of the dialects of the aborigines render this method of communication necessary to them, and it is not surprising it should have arrived at considerable perfection among tribes who, from their situation and manner of life, must often find occasion to make use of it.

Besides these two men, a young Spaniard, a refugee from some of the settlements of New Mexico, joined our party, intending to accompany us as far as his fear of his own countrymen would permit. He had probably been guilty of some misdemeanor, which made it necessary to avoid his former acquaintances, and, on this account, he could not be induced to accompany us into the neighbourhood of the Spanish settlements. The Frenchmen brought with them three horses and a mule, so that our party, which was now supposed to be made up for the journey, consisted, exclusive of the Spaniard, of twenty-two men, thirty-four horses and mules, and two dogs.

We were well armed and equipped, each man carrying a yauger or rifle gun, with the exception of two or three who had muskets; most of us had pistols, all tomahawks and long knives, which we carried suspended at our belts. We believed ourselves about to enter on a district of country inhabited by lawless and predatory bands of savages, where we should have occasion to make use, not only of our arms, but of whatever share of courage and hardihood we might chance to possess.

The country which we passed on the 14th, lying between the Loup fork and the Platte, has a moderately hilly surface, except that portion of it which comprises the bottom lands of the two rivers. The ridges are of little elevation, destitute of stone of any kind, and irregular in direction; the soil is sandy and infertile. The high and barren parts of this tract are occupied by numerous communities of the Prairie dog or Louisiana marmot. [4]

On arriving near the Platte we observed a species of prickly pear (*Cactus ferox. N.*) to become very numerous. It resembles the common prickly pear of New Jersey, (*C. opuntia.*) but is larger, and protected by a more formidable armature of thorns. Our Indian horses were so well acquainted with this plant, and its properties, that they used the utmost care to avoid stepping near it. The flowers are of a sulphur yellow, and when fully expanded are nearly as large as those of the garden pæony, and crowded together upon the summits of the terminal articulations of which the plant consists. These articulations, (or segments contained between the joints,) are oblong and flattened, being longer and thicker than a man's hand. A second species, the *C. mamillaris, N.* occurs on the dry sandy ridges between the Pawnee villages and the Platte. The beautiful cristaria *coccinea. Ph.* (malva *coccinea. N.*) is very frequent in the low plains along the Platte. Its flowers

have nearly the aspect of those of the common wild rose, except that they are more deeply coloured.

We arrived at the Platte, a little before sun-set, the distance from the Pawnees being, according to our computation, twenty-five miles. After entering the valley of the river, we travelled several miles across an unvaried plain, and at length passing down by a gradual descent of a few feet, we came upon a second level tract, extending to the river.

The soil of the first of these portions is a bed of sand, intermixed with small water-worn pebbles and gravel; that of the latter is more fertile, and produces a luxuriant vegetation.

Our guide informed us that the Platte, opposite the point where we entered its valley, contains an island which is more than one day's journey across, and about thirty miles in length.

At no great distance from our camp, which was placed immediately on the brink of the river, we found the body of a horse lying dead in the edge of the water. The animal had, in all probability, been recently lost by a war party of Indians.

15th. Soon after leaving our camp we crossed a small stream, tributary to the Platte, from the north. It is called Great Wood river, and has some timber along its banks.

Our provisions being nearly exhausted, two of the hunters were sent forward in search of game; but after some time they rejoined the party, having killed nothing.

Shortly afterwards a single bison was discovered some miles ahead of the party, and travelling apparently in the same direction. Four of our hunters, having disencumbered their horses of all their baggage, spurred forward in the pursuit, but none of them were able to overtake the animal, except the young Spaniard, who came near enough to wound it with an arrow; but his horse being exhausted, he

was compelled to desist from the pursuit, and suffer the bison to escape.

Having ascended the Platte about sixteen miles, we halted, to make such a dinner as the condition of our stores would allow; and here the Spaniard took his leave of us to return to the Pawnees.

In the scenery of the Platte there is the utmost uniformity; a broad plain, unvaried by any object on which the eye can rest, lies extended before us; on our right are the low and distant hills which bound the valley, and on our left the broad Platte, studded with numerous small but verdant islands. On these islands is usually a little timber, which is not met with in other situations. We were fortunate in finding, towards evening, an old Indian encampment, where were poles, stakes, &c. which had been brought from the islands, and here we placed our camp. Some antelopes were seen during the day, but so wild and vigilant that all our efforts to take them proved unsuccessful. Our supper, therefore, was not of the choicest kind, and, what was infinitely more vexatious to us, was limited in quantity.

On the following day we passed a number of prairie dog villages, some of them extending from two to three miles along the river. Though much in want of game, most of our exertions to take these animals were without success. A number were killed, but we were able to possess ourselves of no more than two of them. These we found to be in good condition and well flavoured. Their flesh nearly resembles that of the ground hog, or woodchuck (Arctomys Marylandica.)

In some small ponds near the Platte we saw the common species of pond weed (Potamogeton *natans* and P. *fluitans*. Ph.) also the Utricularia longirostris, of Leconte, and an interesting species of Myriophillum. [5]

By observations at morning and evening the magnetic variation was found thirteen and an half de-

grees east. In the middle of the day the heat was excessive, and we were under the necessity of halting at a place where no shade could be found to shelter us from the scorching rays of the sun, except what was afforded by our tents, which were set up for this purpose. Here we remained until 4 P. M. when we resumed our journey. We crossed towards evening a small creek, three miles beyond which we arrived at an old Indian camp, where we halted for the night. We had not been long here before a tremendous storm of wind assailed our tents with such violence, that it was only by stationing ourselves outside, and holding the margin to the ground, that we were able to keep them standing.

Two of the hunters who had been sent out during the afternoon, returned to camp late in the evening, bringing in a buck antelope, a highly acceptable acquisition to us, as we had been for some time restricted to short commons. The flesh we found palatable, being very similar in every respect to that of the common deer.

We had proceeded but a few miles from our camp, on the following morning, when we perceived a number of antelopes, at a little distance in the prairie. Being on the windward side of the party, they were not able, by their sense of smelling, to inform themselves of the nature of the danger which was approaching. One of them, leaving his companions, came so near our line as to be within the reach of a rifle ball, and was killed by Lieutenant Swift.

The antelope possesses an unconquerable inquisitiveness, of which the hunters often take advantage, to compass the destruction of the animal. The attempt to approach immediately towards them in the open plain, where they are always found, rarely proves successful. Instead of this, the hunter, getting as near the animal as is practicable, without exciting alarm, conceals himself by lying down, then fixing a handkerchief or cap upon the end of his

ramrod, continues to wave it, still remaining concealed. The animal, after a long contest between curiosity and fear, at length approaches near enough to become a sacrifice to the former. *

In the afternoon a single bison was seen at the distance of several miles, being the second since we had left the Pawnee villages, which were now about a hundred miles distant, and we were beginning to fear that the representations of the Indians, in relation to the difficulty of procuring game to subsist so large a party as ours, would prove true. We found, however, that every part of the country, which we had recently passed, had, at no distant period, been occupied by innumerable herds of bisons. Their tracks and dung were still to be seen in vast numbers; and the surface of the ground was strewed with skulls and skeletons, which were yet undecayed.

At 4 o'clock P. M. we arrived at an old Indian encampment, opposite an island, on which was some wood, and perceiving that none would be met with for many miles a-head, we determined to halt here for the night.

The 18th, being Sunday, we remained in camp. This indulgence was not only highly acceptable to the soldiers and men who accompanied us, they being much harassed and fatigued by their exertions during the week, but was necessary for our horses, which, not being in good condition when we left the Missouri, were perceptibly failing under the laborious services they were made to perform. At our nightly encampments we found it necessary to confine them, as we had not always a plentiful supply of grass in the immediate vicinity of our camp, and if left at large they would wander in search of better pasture, and occasion us great trouble to collect them again in the morning. Accordingly, long ropes had been provided,

* See Bradbury, p. 113.

which were carried constantly on the necks of the horses, and by these they were made fast during the night to stakes driven into the ground. After having eaten all the grass within his reach, the horse was removed to another place, and this was done several times during the night, by a guard kept constantly on duty, both for the performance of this service, and also to give timely notice in case of the approach of Indians to the camp. Notwithstanding this care, on our part, our horses were sometimes but poorly fed, as we were often compelled to encamp in places where little grass was to be found. When we remained in camp during the day, they were suffered to range more at liberty, a watch being kept out to prevent their wandering too great a distance. Notwithstanding the sabbath was devoted to the refreshment of our horses, and the relaxation of the men who accompanied us, some attention was given to the great objects of the expedition. Astronomical observations for the correction of our time-piece, and for other purposes, were made. At Engineer Cantonment we had furnished ourselves with portfolios of paper, to receive specimens of such plants as we might collect; but we found that the precautions which had been used to protect these from the weather had been insufficient, some of our collections being in part wet, and others having been made during the heavy rains, which fell before we reached the Pawnee villages, required much attention. The sabbath also afforded us an opportunity to devote a little attention to the important objects of personal cleanliness and comfort. The plain about our encampment was strewed with the bones of the bison, and other animals; and among the rest we distinguished some of men. We picked up a number of human skulls, one of which we thought it no sacrilege to compliment with a place upon one of our pack-horses. Our guides could give us no satisfactory information of the time and manner in which the several persons,

to whom these bones formerly belonged, had been compelled to lay them down in this place; it is certain, however, that at no very distant period, a battle had been fought, or a massacre committed, on this spot.

We had now arrived at a point about two hundred miles distant from the confluence of the Platte and Missouri, yet the character of the former river was but little changed. It was still from one to three miles in breadth, containing numerous islands, covered with a scanty growth of cotton-wood willows, the amorpha fruticosa, and other shrubs.

CHAPTER VI.

THE PLATTE. — DESERT PLAINS.— MIRAGE. — ARRIVAL AT THE ROCKY MOUNTAINS.

The Platte, called by the Otoes Ne-braska, (Flat river, or water,) is, as its name imports, almost uniformly broad and shoal. It is fordable at almost any place, except when swollen by freshets, which occur in the spring season, from the melting of snow, and occasionally during the other portions of the year, from excessive rain. Its bed is composed almost exclusively of sand, forming innumerable bars, which are continually changing their position, and moving downward, till at length they are discharged into the Missouri, and swept away to the ocean by that rapid and turbulent river.

The range of the Platte, from extreme low to extreme high water is very inconsiderable, manifestly not exceeding six or eight feet. This is about the usual height of its banks above the surface of the sand which forms its bed. The banks are sometimes overflowed, but evidently to no great extent. The rapidity of the current, and the great width of the bed of the river, preclude the possibility of any extensive inundation of the surrounding country. The bottom lands of the river rise by an imperceptible ascent on each side, extending laterally to a distance of from two to ten miles, where they are terminated by low ranges of gravelly hills, running parallel to the general direction of the river. Beyond these the surface is an undulating plain, having an elevation of from fifty to one hundred feet, and presenting the aspect of hopeless and irreclaimable sterility.

The Missouri, in compliance with the usage of boat-men, hunters, &c., has been usually considered under two divisions; the lower extending from the

Mississippi to the confluence of the Platte, and the upper, comprehending all above that point. As might be expected, the influx of so large and so peculiar a river as the Platte, gives a new character to the Missouri below. It is more rapid, more difficult of navigation, and the water more turbid than above.

Among other plants observed about our encampment, was the wild liquorice, (glycyrhiza lepidota, N.) which is believed to be the plant mentioned by Sir A. Mackenzie, which is used as food by the savages of the north-west. The root is large and long, spreading horizontally to a great distance. In taste it bears a very slight resemblance to the liquorice of the shops, but is bitter and nauseous. The leaves are frequently covered with a viscid exudation.

We were prevented from continuing our astronomical observations, in the afternoon, the weather becoming cloudy, and at evening a thunder-storm commenced, which continued with short intermissions during the night. The lightning exhibited an incessant glare, and peals of thunder which seemed to shake the earth to its centre, followed each other in rapid succession.

On Monday the 19th, we moved on, and ascending the Platte about thirty miles, arrived in the evening at a place where the hills on the north side close in, quite to the bed of the river. On both sides they became more broken and elevated, and on the north, they approached so near to the bed of the Platte, that we were under the necessity of travelling across them. We were glad, however, of any change of scene. The monotony of a vast unbroken plain, like that in which we had now travelled nearly one hundred and fifty miles, is little less tiresome to the eye, and fatiguing to the spirit, than the dreary solitude of the ocean.

With this change of the surface, some change is observed in the vegetable products of the soil. Here

we first saw a new species of prickly poppy*, with a spreading white flower, as large as that of the common poppy of the gardens. The aspect of this plant is very similar to that of the common poppy, except that the leaves are covered with innumerable large and strong prickles. When wounded it exudes a thick yellowish sap, intensely bitter to the taste. On the summits of some of the dry sandy ridges, we saw a few of the plants called Adam's needles, (yucca angustifolia) thriving with an appearance of luxuriance and verdure, in a soil which bids defiance to almost every other species of vegetation. Nature has, however, fitted the yucca for the ungenial soil it is destined to occupy. The plant consists of a large tuft of rigid spear-pointed leaves, placed immediately upon the root, and sending up in the flowering season, a stalk bearing a cluster of lilliaceous flowers as large as those of the common tulip of the gardens. The root bears more resemblance to the trunk of a tree, than to the roots of ordinary plants. It is two or three inches in diameter, descending undivided to a great depth below the surface, where it is impossible the moisture of the earth should ever be exhausted, and there terminates in numerous spreading branches. In some instances, the sand is blown from about the root, leaving several feet of it exposed, and supporting the dense leafy head, at some distance from the surface. [6]

Several bisons and other game, had been seen in the course of the day, but nothing taken. As our provisions were now exhausted, it was resolved to remain encamped where we were, while parties were sent out in different directions to hunt. [7]

Being now at a place where, as our guide informed us, the Pawnees often cross the Platte, and as it was our intention to ascend on the other side of the river, Major Long rode across to ascertain the practicability

* Argemone alba, a large plant, very distinct from A. mexicana.

of fording; but the summer freshet being now at its height, it was found the river could not be crossed without swimming, and the design was relinquished. Six of our party, including the hunters, were sent out in pursuit of game.

At camp, observations were taken for ascertaining longitude and other purposes. At evening, Mr. Peale returned, having killed an antelope at the distance of ten miles from the camp, and brought it within about four, where being fatigued and hungry, he had made a fire, cooked and ate part of the animal, and left the remainder, suspending a handkerchief near it, to protect it from the wolves. Soon afterwards others returned, and when all were collected, it appeared there had been killed one bison, two antelopes, and a hare, all at a distance from camp. Horses were accordingly sent out to bring in the meat, a part of which we attempted to dry during the night, by cutting it in thin pieces and exposing it over a slow fire, but a storm of wind and rain, which continued greater part of the night, prevented our success in this attempt.

21st. The storm continued throughout the night, and the following day was cold, with a heavy mist from the south-east.

After travelling this day our customary distance, which was about twenty-five miles, we were compelled to halt at a place where we could find no poles to set up our tents. We were fortunate in finding part of a tree which had drifted down the Platte, and which sufficed to make a fire for the cooking of our supper. An Indian dog, who had made his appearance at the encampment on the preceding day, had followed us thus far, but kept aloof, not allowing us to come within one or two hundred yards of him.

On the following morning, six miles from our camp, we arrived at the confluence of the north and south fork of the Platte. We had halted here, and were making preparations to examine the north fork, with a view of crossing it, when we saw two elk plunge into the river a little above us on the same

side. Perceiving it was their design to cross the river, we watched them until they arrived on the other side, which they did without swimming. We accordingly chose the same place they had taken, and putting a part of our baggage in a skin canoe, waded across, leading our horses, and arrived safely on the other side; no accident having happened, except the wetting of such of our baggage as was left on the horses.

The north fork at its confluence is about eight hundred yards wide, is shoal and rapid like the Platte, and has a sandy bed. We were informed by our guide, who had been repeatedly to its sources, that it rises within the Rocky Mountains, about one hundred and twenty miles north of the sources of the Platte.

It is probably the river which was mistaken by Captain Pike for the Yellow-stone, and has been laid down as such on his map, whence the mistake has been copied into several others. It has its source in numerous small streams, which descend from the hill surrounding a circumscribed valley within the mountains, called the Bull-pen. This basin is surrounded by high and rugged mountains, except at the place where the north fork passes into the plains. On each side of this strait, or pass, are high and abrupt rocky promontories, which confine the river to a narrow channel. The diameter of the circumscribed valley, called the Bull-pen, is one day's travel, about twenty miles. The upper branches of the north fork have some timber, mostly cotton-wood and willow, and abound in beaver. [8]

From the limited information communicated to the public, on the subject of Mr. Hunt's Expedition to the mouth of the Columbia, commenced in the year 1811, it appears that a part of the men engaged in that undertaking, in their return from the Pacific, crossed the Rocky Mountains from some one of the upper branches of Lewis' river, and falling upon the sources of the north fork of the Platte, descended thence to the Missouri.

On the 28th of June, 1812, Mr. Robert Stewart, one of the partners of the Pacific Fur Company, with two Frenchmen, M'Clellan, and Crooks, left the Pacific ocean with despatches for New York.

Having proceeded about seven hundred miles, they met Mr. Joseph Miller, on his way to the mouth of the Columbia. He had been considerably to the south and east, and had fallen in with the Black-arms, and Arrapahoes, who wander about the sources of the Arkansa. By the latter of these he had been robbed, in consequence of which he was now reduced to starvation and nakedness.

Mr. Stewart and his companions had fifteen horses, but soon afterwards met with a band of the Crow Indians, near the Rocky Mountains, who behaved with the most unbounded insolence, and finally stole every horse belonging to the party.

They now found themselves on foot, with the Rocky Mountains, and a journey of two thousand miles before them; fifteen hundred of which was through a country wholly unknown, as their route lay considerably to the south of that of Lewis and Clarke.

Putting the best face upon their prospects, they pursued their journey towards the Rocky Mountains, travelling east-south-east, until they struck the "head waters of the great river Platte," which they followed to its mouth, having spent the winter upon it, six hundred miles from the Missouri. *

The confluence of the north fork and the Platte is, according to our estimate of distances, one hundred and forty-nine miles by our courses, from the Pawnee Loup village.

Some of the upper branches of the Wolf river head about thirty miles to the north of this point.

After fording the north fork, we crossed a narrow point of low prairie to the Platte, where, as it was

* The narrative from which this sketch is taken, was published in the Missouri Gazette.

now near night, we resolved to encamp, and attempt the passage of the river on the following day.

Our view of the opposite margin of the Platte, during this day's march, had been intercepted by an elevated swell of the surface, which extended along, parallel to the river, that we were now approaching. Immediately upon surmounting this undulation we saw before us, upon the broad expanse of the left margin of the river, immense herds of bisons, grazing in undisturbed possession, and obscuring, with the density of their numbers, the verdant plain; to the right and left, as far as the eye was permitted to rove, the crowd seemed hardly to diminish, and it would be no exaggeration to say, that at least ten thousand here burst on our sight in the instant. Small columns of dust were occasionally wafted by the wind from bulls that were pawing the earth, and rolling; the interest of action was also communicated to the scene, by the unwieldy playfulness of some individuals, that the eye would occasionally rest upon, their real or affected combats, or by the slow or rapid progress of others to and from their watering places. On the distant bluffs, individuals were constantly disappearing, whilst others were presenting themselves to our view, until, as the dusk of the evening increased, their massive forms, thus elevated above the line of other objects, were but dimly defined on the skies. We retired to our evening fare, highly gratified with the novel spectacle we had witnessed, and with the most sanguine expectations of the future.

In the morning we again sought the living picture, but upon all the plain which last evening was so teeming with noble animals, not one remained. We forded the Platte with less delay and difficulty than we had encountered in crossing the north fork.

It is about nine hunded yards wide, and very rapid, but so shoal that we found it unnecessary to dismount from our horses, or to unpack the mules.

We found the plains on the south side of the Platte more closely depastured than those we had before seen. The grass is fine and short, forming a dense and matted turf, as in the oldest pastures.

Meeting with wood at about three o'clock P. M., we resolved to encamp. On the two preceding evenings, we had found it difficult to collect as much wood as sufficed to kindle a fire, which was afterwards kept up with the dung of the bison, though not without some difficulty, as the weather was rainy.

The dung of the bison is used as fuel in many parts of the woodless country south-west of the Missouri, by the Indians, and by hunters, who often encamp where no wood is to be found. We learn from Sonnini and others, that the excrement of the camel, mixed with chopped straw and afterwards dried, is similarly used in the woodless parts of Egypt.

The hills on the south side of the Platte, above the confluence of the north fork, become more abrupt and elevated, approaching in character those of the Missouri which are destitute of stone. There is here the same transcript of Alpine scenery, in miniature, which constitutes so striking a feature in the Missouri landscape, when viewed from the river bottom.

We had no sooner crossed the Platte, than our attention was arrested by the beautiful white primrose (œnothera pinnatifida, N.) with its long and slender corrolla reclining upon the grass. The flower, which is near two inches long, constitutes about one-half of the entire length of the plant. [9]

The valley of the Platte, above the forks, is much narrower, and a little more irregular in direction than below, and is frequently interrupted by small hills running in towards the river. On ascending these hills, we found them of a coarse sand, and containing more gravel and small pebbles than below. Among the gravel stones, small fragments of flesh-

coloured felspar are distinguished. About the summits of the hills we saw some detached pieces of fine carnelion, with agates and calcedony.

We had often examined, with some anxiety, the turbid waters of the Platte, hoping thereby to gain information respecting the predominating rock formations of the mountainous district, from which that river descends.

It had been a received opinion among some of the geologists of the United States, that the Rocky Mountains were not of primitive rocks; we had hitherto observed nothing which could either confirm or invalidate this opinion.

The great alluvial formation, which occupies the country on both sides of the lower portion of the river Platte, is an almost unmixed siliceous sand, in no manner distinguishable from the *débris* of the sandstones of transition mountains. Near the forks of the Platte, we first observed that the waters of that river bring down, among other matters, numerous small scales of mica. This also is a constituent of the sandstones of the lower secondary or transition formations. The fragments of unmixed and crystalline felspar, which now began to be of frequent occurrence, were considered as the first convincing evidence of the primitive character of the Rocky Mountains. These fragments of felspar, we believed, could have been derived from no other than primitive rocks.

During all the day on the 23d we travelled along the south side of the Platte, our course inclining something more towards the south-west than heretofore.

Intermixed in the narrow fringe of timber, which marks the course of the river, are very numerous trees, killed by the action of the beaver or by the effects of old age; their decorticated and bleached trunks and limbs strongly contrasting with the surrounding objects, many of them rendered doubly

interesting by affording a support to the nests of the bald eagle, elevated like a beacon in the horizon of the traveller.

Large herds of bisons were seen in every direction; but as we had already killed a deer, and were supplied with meat enough for the day, none of the party were allowed to go in pursuit of them. Prickly pears became more and more abundant as we ascended the river; and here they occurred in such extensive patches as considerably to retard our progress, it being wholly impracticable to urge our horses across them. The cactus ferox is the most common, and, indeed, the only species which is of frequent occurrence. It has been stated by a traveller to the Upper Missouri *, that the antelope, which inhabits the extensive plains of that river and its tributaries, finds means to make this plant, notwithstanding its terrific armature of thorns, subservient to its necessities, "by cutting it up with his hoofs." We were able to discover no confirmation of this statement; it may, however, be applicable to some plains more arid and sterile than any we have passed, where the antelopes may be driven by necessity to the use of this hard expedient.

On the following day we saw immense herds of bisons, blackening the whole surface of the country through which we passed. At this time they were in their summer coat. From the shoulders backwards, all the hinder parts of the animal are covered with a growth of very short and fine hair, as smooth and soft to the touch as a piece of velvet. The tail is very short, and tufted at the end, and its services, as a fly-brush, are confined to a very limited surface.

The fore parts of the body are covered with long shaggy hair, descending in a tuft behind the knee, in a distinct beard beneath the lower jaw, rising in a dense mass on the top of his head as high as the tip of the horns, matted and curled on his front so

* Nuttall's Genera of North American Plants, vol. i. p. 296.

thickly as to deaden the force of the rifle-ball, which rebounds from the forehead, or lodges in the hair, causing the animal only to shake his head as he bounds heavily onward. The head is so large and ponderous, in proportion to the size of the body, that the supporting muscles, which greatly enlarge the neck, form over the shoulders, where they are imbedded on each side of elongated vertebral processes, distinguished by the name of hump ribs, a very considerable elevation called the hump, which is of an oblong form, diminishing in height as it recedes, so as to give considerable obliquity to the line of the back. The eye is small, black, and piercing; the horns, which are black, and remarkably robust at base, curve outward and upward, tapering rapidly to the tip. The profile of the face is somewhat convexly curved; and the superior lip, on each side, papillous within, is dilated and extended downward, so as to give a very oblique appearance to the lateral rictus, or gape of the mouth, considerably resembling in this respect the ancient architectural bas-reliefs representing the heads of the ox. The physiognomy is menacing and ferocious, and the whole aspect of the animal is sufficiently formidable to influence the spectator who is, for the first time, placed near him in his native wilds, with certain feelings which indicate the propriety of immediate attention to personal safety.

The bison cow bears the same relation, as to appearance, to the bull, that the domestic cow does to her mate; she is smaller, with much less hair on the anterior part of her body, and though she has a conspicuous beard, yet this appendage is comparatively short; her horns also are much less robust, and not partially concealed by hair.

The dun colour prevails on the coat of the bison; but the long hair of the anterior part of the body, with the exception of the head, is more or less tinged with yellowish or rust colour. The uniformity of

colour, however, amongst these animals is so steadfast, that any considerable deviation from the ordinary standard is regarded by the natives as effected under the immediate influence of the Divinity.

A trader of the Missouri informed us that he had seen a grayish-white bison, and that another, a yearling calf, was distinguished by several white spots on the side, and by a white frontal mark and white fore feet.

Mr. J. Dougherty saw in an Indian hut a bison head, very well prepared, which had a white star on the front; the owner valued it highly, calling it his great medicine; he could not be tempted to part with it; "for," said he, "the herds come every season into the vicinity to seek their white-faced companion."

They are the skins of the cows almost exclusively that are used in commerce; those of the bulls being so large, heavy, and difficult to prepare, that this is comparatively seldom attempted.

That the bison formerly ranged over the Atlantic states there can be no doubt; and Lawson informs us that even in his time some were killed in Virginia; and Cumming, in his Sketches of a Tour to the Western Country, informs us that, "long after the country (Kentucky) began to be generally settled, and ceased to be a hunting ground by the Indians," the "buffaloes, bears, and deer, were so plenty in the country that little or no bread was used," and "the facility of gaining them prevented the progress of agriculture, until the poor innocent buffaloes were completely extirpated, and the other wild animals much thinned." This process of extirpation has not since been relaxed, and the bison is now driven beyond the lakes, the Illinois, and southern portion of the Mississipi rivers, their range extending from the country west of Hudson's bay to the northern provinces of Mexico. They have not yet crossed the entire breadth of the mountains at the

head of the Missouri, though they penetrate, in some parts, far within that range, to the most accessible fertile valleys, particularly the valley of Lewis' river. It was there that Mr. Henry and his party of hunters wintered, and subsisted chiefly upon the flesh of these animals, which they saw in considerable herds; but the Indians affirmed that it was unusual for the bisons to visit that neighbourhood.

All the mountains which we ascended were more or less strewed with the dung of these animals about the lower parts; a conclusive evidence that this portion of the range had been traversed by the bisons.

The cows remain fat from July to the latter part of December. The rutting season occurs towards the latter part of July, and continues until the beginning of September, after which month the cows separate from the bulls, in distinct herds, and bring forth their calves in April. The calves seldom separate themselves from the mother under the age of one year; and cows are often seen accompanied by the calves of three seasons.

The meat of the bison has often been compared with that of the domestic ox, and the preference yielded to the latter, as an article of food. This decision, however, we cannot, from our experience confirm; it appeared to us that although of a somewhat coarser fibre, yet, after making due allowance for the situation in which we were placed, our appetites often increased by hunger and privation, that the flesh of the bison is in no degree inferior in delicacy and sweetness to that of the common ox. But that the flesh of those which we were accustomed to eat was more agreeably sapid than that which formed a subject of comparison to the authors alluded to, is altogether possible, as the grass upon which they usually fed was short, firm, and nutritious, considerably differing in its nature from the luxuriant and less solid grass nourished by a fertile soil. It was

preferred by the party to the flesh of the elk or deer, which was thrown away when it could be substituted by the bison meat.

To the fat of the bison we conceded a decided superiority over that of the common ox, as being richer and sweeter to the taste.

As our stock of provision was nearly exhausted, permission was given, when we had arrived near a suitable place for our mid-day halt, to the hunters to go out in pursuit of bisons, and in a short time two were killed. The choice parts of these were taken and placed upon pack-horses, to be carried forward to our next encampment, where some of it might be *jerked* on the ensuing day, which was Sunday.

Aside from the vast herds of bisons which it contains, the country along the Platte is enlivened by great numbers of deer, badgers *, hares †, prairie wolves, eagles, buzzards ‡, ravens, and owls: these, with its rare and interesting plants, in some measure relieved the uniformity of its cheerless scenery. We found a constant source of amusement in observing the unsightly figure, the cumbrous gait, and impolitic movements of the bison; we were often delighted by the beauty and fleetness of the antelope, and the social comfort and neatness of the prairie dog.

This barren and ungenial district appeared, at this time, to be filled with greater numbers of animals than its meagre productions are sufficient to support. It was, however, manifest that the bisons, then thronging in such numbers, were moving towards the south. Experience may have taught them to repair at certain seasons to the more luxuriant plains of Arkansa and Red river. What should ever prompt them to return to the inhospitable deserts of the Platte, it is not perhaps, easy to conjecture. In what-

* Meles labradoricus.

† Lepus variabilis? possibly it may prove to be L. glacialis of Leach.

‡ Vultur aura.

ever direction they move, their parasites and dependants fail not to follow. Large herds are invariably attended by gangs of meagre, famine-pinched wolves, and flights of obscene and ravenous birds,

We have frequently remarked broad shallow excavations in the soil, of the diameter of from five to eight feet, and greatest depth from six inches to eighteen. These are of rare occurrence near the Missouri, as far as Engineer cantonment, and in other districts where the bison is seldom seen at the present day; and when they do exist there, they are overgrown by grass and nearly obliterated. As you approach the country, still the constant residence of these animals, the excavations become more numerous, and are less productive of grass. They now are so numerous as to be of constant recurrence, offering a considerable impediment to the traveller, who winds his way amongst them, and are entirely destitute of grass, their surface being covered with a deep dust. Until recently, we had no opportunity to observe the cause which gives rise to these appearances; but we were now convinced that they were the result of the habit which the bulls have, in common with the domestic bull, of scraping up the earth with their fore feet, in the process of dusting themselves: they serve also as places for rolling and wallowing; a gratification which the bison bull indulges in as frequently, and in the same manner as the horse.

Some extensive tracts of land along the Platte, particularly those portions which are a little elevated, with an undulating or broken surface, are almost exclusively occupied by a scattered growth of several species of wormwood, (artemisia) some of which are common to this country, and that on the lower Missouri: we may enumerate the following —A. ludoviciana, A. longifolia, A. serrata, A. columbiensis *,

* A. columbiensis. This is said to be the plant known to the party of Lewis and Clarke, by the name of "wild sage." It occurs

A. cernua, A. canadensis; most of these species have simple or finely divided compound leaves, which are long and slender, and canescent, like those of the A. absynthium, the common wormwood of the gardens. The peculiar aromatic scent, and the flavor of this well known plant, is recognized in all the species we have mentioned. Several of them are eaten by the bisons, and our horses were sometimes reduced to the necessity of feeding upon them.

The intense reflection of light and heat from the surface of many tracts of naked sand, which we crossed, added much to the fatigue and suffering of our journey. We often met with extensive districts covered entirely with loose and fine sand blown from the adjacent hills. In the low plains along the river, where the soil is permanent, it is highly impregnated with saline substances, and too sterile to produce any thing except a few stinted carices and rushes.

On the evening of the twenty-fourth, after we had encamped, several bull bisons, being on the windward side, came so near us as to create a disturbance among our horses, who were not yet so familiarized to the formidable appearance of those animals, as to regard their near approach with indifference. The bulls at length became troublesome, approaching so near to smell at the horses, that some of the latter broke the cords by which they were fastened, and made their escape. A man was then sent to frighten away the bisons, who, in their turn, exhibited as much terror as they had occasioned to our horses.

On Sunday, the twenty-fifth, we remained encamped, and some of the men were employed in drying a part of the meat killed on the preceding day.

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abundantly in the barren plains of the Columbia river; where it furnishes the sole article of fuel or of shelter to the Indians who wander in those woodless deserts. See Nuttall's Genera, vol. ii. p. 142.

This was done that we might be able to carry constantly with us a small supply of provisions, in reserve against any occasion when we might not meet with game.

The magnetic variation equated from two sets of observations, was found to be 14° east. Observations for longitude were made; it was also attempted to take the meridian altitude of Antares for ascertaining the latitude, but the observation was commenced a few minutes too late, we having been longer occupied in making the preceding observations than we had anticipated.

26th. The weather had now been for some days fair. As we approached the mountains, we felt or fancied, a very manifest change in the character of of the weather, and the temperature of the air. Mornings and evenings were usually calm, and the heat more oppressive than in the middle of the day. Early in the forenoon, a light and refreshing breeze often sprung up, blowing from the west or south-west, which again subsided on the approach of night. This phenomenon was so often observed that we were induced to attribute it to the operation of the same local cause, which in the neighbourhood of the sea, produces a diurnal change in the winds, which blow alternately to and from the shore. The Rocky Mountains may be considered as forming the shore of that sea of sand, which is traversed by the Platte, and extends northward to the Missouri, above the great bend.

The rarefaction of the air over this great plain, by the reverberation of the sun's rays during the day, causes an ascending current, which is supplied by the rushing down of the condensed air from the mountains. Though the sun's rays in the middle of the day were scorching and extremely afflictive to our eyes, the temperature of the air, as indicated by the thermometer, had hitherto rarely exceeded 80° Fah.

In the forenoon we passed a range of hills more elevated than any we had seen west of the Missouri. These hills cross the Platte from north to south, and though inconsiderable in magnitude, they can be distinguished extending several miles on each side of the river. They consist principally of gravel, intermixed with small water-worn fragments of granite and other primitive rocks, but are based on a stratum of coarse friable sand-stone, of a dark gray colour, which has been uncovered, and cut through by the bed of the Platte.

This range may perhaps be a continuation or spur from the black hills mentioned by Lewis and Clarke, as containing the sources of the Shienne, and other tributaries to the Missouri, at no great distance to the north of the place where we now were.

At evening we arrived at another scattering grove of cotton-wood trees, among which we placed our camp, immediately on the brink of the river. The trees of which these insulated groves are usually composed, from their low and branching figure, and their remoteness from each other, as they stand scattered over the soil they occupy, revived strongly in our minds the appearance and gratifications resulting from an apple orchard; for which from a little distance they might readily be mistaken, if seen in a cultivated region. At a few rods distant on our right hand, was a fortified Indian camp, which appeared to have been recently occupied. It was constructed of such broken half-decayed logs of wood as the place afforded, intermixed with some skeletons of bisons recently killed. It is of a circular form, enclosing space enough for about thirty men to lie down upon. The wall is about five feet high, with an opening towards the east, and the top uncovered.

At a little distance in front of the entrance of this breastwork, was a semicircular row of sixteen bison skulls, with their noses pointing down the river. Near the centre of the circle which this row would

describe, if continued, was another skull marked with a number of red lines.

Our interpreter informed us that this arrangement of skulls and other marks here discovered, were designed to communicate the following information, namely, that the camp had been occupied by a war party of the Skeeree or Pawnee Loup Indians, who had lately come from an excursion against the Cumancias, Ietans, or some of the western tribes. The number of red lines traced on the painted skull indicated the number of the party to have been thirty-six; the position in which the skulls were placed, that they were on their return to their own country. Two small rods stuck in the ground, with a few hairs tied in two parcels to the end of each, signified that four scalps had been taken.

A record of facts, which may be important and interesting to others, is thus left for the benefit of all who may follow. For our part we were glad to be informed, that one lawless and predatory band of savages had lately left the country we were about to traverse. We were never without some anxiety on the subject of Indian war-parties; who are known frequently to remunerate themselves for any discomfiture or loss they may have sustained, by making free booty of the property and the scalps of the first weak or unguarded party they may meet.

At a late hour in the night, after our camp had become quiet, we were suddenly awakened by a loud rushing noise, which in a moment seemed to reach the centre of our encampment; immediately a piercing exclamation of terror was heard from one of our interpreters, which, from the peculiarity of its tone, seemed to have escaped from a throat under the grasp of death. It became immediately apparent that the cause of the alarm proceeded from our horses, all of whom had broken loose from their stakes, near the Indian fort, and had run in a state of fright through our camp, with the apparent desire to gain our pro-

tection against something in their rear. We proceeded in a cautious manner to reconnoitre the environs of the camp, stooping low, in order that the eye might be directed along the level of the top of the grass, which was here of a very luxuriant growth, in order to detect in the gloom, any inimical object that might rise above it; having thus convinced ourselves that nothing dangerous to our safety remained very near to us, the horses were again secured, and we betook ourselves to our beds, with the reflection, that they had probably been alarmed by the too near approach of bisons.

We had scarce fallen asleep, when we were aroused the second time, by the discharge of a gun close to our tent. This was the signal which we had all understood was to be given by the sentinel, in case of the hostile approach of Indians to the camp. We therefore bestirred ourselves, being well assured we had other business at hand, than the securing of horses. Several of the party went to reconnoitre the old fort above mentioned, but nothing was discovered and they returned.

After all were assembled at camp, Major Long informed us the alarm had been given by his order, and was intended to test the coolness and self-possession of the party, and to prepare us in some measure for an unpleasant occurrence, we all thought too likely to happen, which was no other than a serious attack from the Indians, to be made according to their custom at that highly unseasonable hour of the morning.

Since leaving the Missouri, we had never indulged a disposition to sluggishness, accustoming ourselves to rise every morning long before the sun; but we still found we left that small spot of earth, on which we had rested our limbs, and which had become warm and dry by the heat of our bodies, with as much reluctance as we have felt at quitting softer beds.

The mode of rallying now prescribed was the following; immediately after an alarm should be given, the party should seize their arms, and form in front of the tents, in the rear of the line of packs, and await any orders that might be given. The sentinel giving the alarm should proceed to the tent of the officers, in order to acquaint them with the cause. Major Long and Captain Bell should reconnoitre about the encampment, and if practicable ascertain the real occasion of the alarm. Farther movements to be regulated as the emergency might require.

This alarm was the occasion of our starting on the morning of the 26th at an earlier hour than usual. We rode on through the same uninteresting and dreary country as before, but were constantly amused at observed the motions of the countless thousands of bisons, by which we were all the time surrounded. The wind happening to blow fresh from the south, the scent of our party was borne directly across the Platte, and we could distinctly note every step of its progress through a distance of eight or ten miles, by the consternation and terror it excited among the buffaloes. The moment the tainted gale infected their atmosphere, they ran with as much violence as if pursued by a party of mounted hunters, and instead of running from the danger, turned their heads towards the wind; eager to escape from the terrifying scent, they pushed forward in an oblique direction towards our party, and plunging into the river they swam and waded, and ran with the utmost violence, in several instances breaking through our line of march, which was immediately along the left bank of the Platte.

It is remarked by hunters, and appears to be an established fact, that the odour of a white man is more terrifying to wild animals, particularly the bison, than that of an Indian. This animal, in the course of its periodic migrations, comes into the immediate

neighbourhood of the permanent Indian villages, on the Missouri and the Platte. One was seen by our hunters within six miles of the Grand Pawnee village, and immediately about the towns we saw many heads and skeletons of such as had been killed there the preceding spring. They had come in while the Pawnees were absent on their winter's hunt, and at their return, we were informed, they found the bisons immediately about their villages. They disappeared invariably from the neighbourhood of the white settlements within a few years. We are aware that another cause may be found for this than the frightful scent of the white man, which is, the impolitic exterminating war which he wages against all unsubdued animals within his reach.

It would be highly desirable that some law for the preservation of game might be extended to, and rigidly enforced in the country where the bison is stil met with; that the wanton destruction of these valuable animals, by the white hunters, might be checked or prevented. It is common for hunters to attack large herds of these animals, and having slaughtered as many as they are able, from mere wantonness and love of this barbarous sport, to leave the carcasses to be devoured by the wolves and birds of prey; thousands are slaughtered yearly, of which no part is saved except the tongues. This inconsiderate and cruel practice is undoubtedly the principal reason why the bison flies so far and so soon from the neighbourhood of our frontier settlements.

It is well known to those in the least degree conversant with the Indians, that the odour which their bodies exhale, though very strong and peculiar, is by no means unpleasant, [10] at least to most persons. A negro in the employment of the Missouri Fur Company, and living at Fort Lisa, was often heard to complain of the intolerable scent of the squaws; in like manner, the Indians find the odour of a white man extremely offensive. In the language of the

Peruvian Indians, are three words to express their idea of the smell of the European, the aboriginal American, and the negro. They call the first *Pezuna*, the second *Posco*, and the third *Grajo*.

After passing the range of hills above mentioned, the surface subsides nearly to a plain, having, however, manifestly a greater inclination than below. The velocity of the current of the river is much increased, the bed narrower, and the banks more precipitous. We passed several extensive tracts nearly destitute of vegetation. The surface of these consisted entirely of coarse sand and gravel, with here and there an insulated mass of clay, highly impregnated with salt, and gnawed and licked into various singular shapes, exhibiting the forms of massive insulated columns, huge buttresses, prominent angles, and profound excavations, fortuitously mingled, and which are now gradually diminishing, under the action of the cause which produced them. The present surface upon which they repose, seems to be a stratum of a different earth, which does not afford the condiment so attractive to the animals; the consequence is, that the licking and chewing, principally, heretofore, affecting the surface on which the animal stood, is now directed against the upright portions of this singular grand excavation, and most remarkable of all known salt-licks.

Some extensive portions of the immediate bottom land, along the river, were white with an effloresced salt, but this being impure and but imperfectly soluble, did not appear to have been licked.

Towards evening we passed two springs of transparent, but impure and brackish water. They were the first we had met with on the Platte. Among a considerable number of undescribed plants collected on the 27th, are three referable to the family of the rough-leaved plants (asperifoliæ), one of them be-

* See Humboldt's New Spain, vol. i. p. 184.

longing to a genus not heretofore known in the United States. It has a salver-form corolla, with a large spreading angular, plaited border. Another plant very conspicuously ornamental to these barren deserts, is a lactescent annual, belonging to the family of the convolvulaceæ, with a bright purple corolla, as large as that of the common stramonium. We also observed the white-stalked primrose, (œnothera albicaulis, N.) a very small white-flowered species of talinum, and some others. We observed, in repeated instances, several individuals of a singular genus of reptiles (chirotes, Cuv.) which in form resemble short serpents, but are more closely allied to the lizards, by being furnished with two feet. They were so active, that it was not without some difficulty that we succeeded in obtaining a specimen. Of this (as was our uniform custom, when any apparently new animal was presented) we immediately drew out a description. But as the specimen was unfortunately lost, and the description formed part of the zoological notes and observations, which were carried off by our deserters, we are reduced to the necessity of merely indicating the probability of the existence of the chirotes lumbricoides of naturalists, within the territory of the United States.

At night we were again alarmed by a disturbance among our horses, of which we were not able to ascertain the cause. Some of the party had, on the preceding day, reported that they had seen Indians at a distance, that they were on horseback, &c. but of this there could be no certainty, the imagination often representing a herd of antelopes, or other animals, seen at a distance, and perhaps distorted by the looming of the prairie, as so many mounted Indians. We had often found ourselves more grossly abused by our eye-sight, than is supposed in this instance, having mistaken turkies for bisons, wolves for horses, &c.

28th. We breakfasted, and left our encampment

before five o'clock. We had not proceeded far when we discovered about thirty wild horses at a distance before us. They had taken our scent, and run off in a fright, when we were a mile distant. Their activity and fleetness surpassed what we had expected from this noble animal in his savage state. In the course of the day we saw other herds, but all at a distance. The country south of the Platte contains, as we are informed, vast numbers of horses. They are of the domesticated stock introduced by the Spaniards, but they multiply rapidly in their present state of regained freedom, and are apparently wilder than any of the native occupants of this country. They are of various colours, and of all sizes, there being many colts, and some mules, among them. Their playfulness, rather than their fears, seemed to be excited by our appearance, and we often saw them, more than a mile distant, leaping and curvetting, involved by a cloud of dust, which they seemed to delight in raising.

About some sandy ridges, which we passed in the middle of the day, several miliary rattle-snakes were seen, two of which were killed. These had been occasionally met with all along the Platte, but were by no means numerous. Mr. Peale killed a female antelope, without leaving our line. The animal had not been able to satisfy its curiosity, and stood at a little distance gazing at us, until it was shot down.

During the day we passed three small creeks discharging into the Platte from the north-west. One of these, called by the Indians Bat-so-ah, or Cherry creek, heads in the Rocky Mountains. On these creeks are a few small cotton-wood and willow trees. These trees, as well as all those along the Platte, are low, with very large and branching tops, as is the case with all trees which grow remote from each other.

In the afternoon hunters were sent forward, but it was not without some difficulty that a single bison

was killed, those animals having become much less frequent. [11]

Our small stock of bread was by this time so nearly exhausted, that it was thought prudent to reserve the remainder as a last resort, in case of the failure of a supply of game, or other accident. A quantity of parched maize, equal to a gill per day, to each man, was daily distributed to each of the three messes into which the party was divided. This was thrown into the kettle where the bison meat was boiled, and supplied the place of barley in the soup, always the first and most important dish. Whenever game was plenty we had a variety of excellent dishes, consisting of the choice parts of the bison, the tongue, the hump ribs, the marrow-bones, &c. dressed in various ways. The hump ribs of the bison, which many epicures prefer to any other part of the animal, are the spinous processes of the backbone, and are from eighteen to twenty-four inches in length. They are taken out with a small portion of the flesh adhering to each side, and whether roasted, boiled, or stewed, are certainly very far superior to any part of the flesh of the domestic ox.

29th. We had proceeded but a few miles from our camp when it was found that Mr. Say's horse was so far exhausted as to be unable to proceed at the same pace as the other horses. Mr. Say accordingly dismounted, and by driving his horse before him, urged the animal along for a few miles; but this being found too laborious, and as several of the horses were near failing, it was determined to halt, which we did at ten o'clock, and remained in camp during the day.

The country, for several miles to the west of the range of hills mentioned above, is as uniformly plain as that on any part of the Platte. It differs from that further to the east only in being of a coarser sand, and in an aspect of more unvaried sterility. The cactus ferox reigns sole monarch, and sole possessor

of thousands of acres of this dreary plain. It forms patches which neither a horse nor any other animal will attempt to pass over. The rabbit's foot plantation, and a few brown and withered grasses, are sparingly scattered over the intervening spaces. In depressed and moist situations, where the soil is not so entirely unproductive, the variegated spurge (euphorbia variegata), with its painted involucrum and party-coloured leaves, is a conspicuous and beautiful ornament. The lepidium virginicum, distributed over every part of northern and equinoctial America, from Hudson's Bay to the summit of the Silla of Caraccas *, is here of such diminutive size that we were induced to search, though we sought in vain, for some character to distinguish it as a separate species.

At three o'clock P. M. the planet Venus was distinctly visible. Its distance from the sun at 3h. 45m. was east 36° 15′. There were a few broken cumulo-stratose clouds from the south-west, otherwise the sky was clear, and near the zenith, where the star was seen, of a deep and beautiful azure. Our actual elevation, at this time, must have been considerable, and might be supposed to effect, in some degree, the transparency of our atmosphere.

Several magpies were seen about the islands in the river, where it is probable they rear their young.

On the 30th we left the encampment at our accustomed early hour, and at eight o'clock were cheered by a distant view of the Rocky Mountains. For some time we were unable to decide whether what we saw were mountains, or banks of cumulous clouds skirting the horizon, and glittering in the reflected rays of the sun. It was only by watching the bright parts, and oberving that their form and position remained unaltered, that we were able to satisfy ourselves they were indeed mountains. They were visible from the lowest parts of the plain, and

* See Humb. Pers. Nar. vol. iii. p. 500.

their summits were, when first discovered, several degrees above our horizon. They became visible by detaching themselves from the sky beyond, and not by emerging from beneath the sensible horizon, so that we might have seen them from a greater distance had it not been for the want of transparency in the atmosphere. Our first views of the mountains were indistinct, on account of some smokiness of the atmosphere, but from our encampment, at noon, we had a very distinct and satisfactory prospect of them. A small part only of the intervening plain was visible, the convexity of the surface intercepting the view from the base of the mountains, and that portion of the plain adjacent to it.

Snow could be seen on every part of them which was visible above our horizon.

The thermometer immersed in the water of the river fell from 80°, the temperature of the atmosphere, to 75°. Observations had been made daily to ascertain the temperature of the water of the Platte. [12] Notwithstanding there were only about five degrees of difference between the temperature of the air and that of the water, it was remarked by several of the party, that a sensation of extreme cold was felt on passing from the one to the other.

It is possible, that at the elevation we had now attained, the rapidity of evaporation, on account of the diminished pressure of the atmosphere, might be something greater than we had been accustomed to. For several days the sky had been clear, and in the morning we had observed an unusual degree of transparency in every part of the atmosphere. As the day advanced, and the heat of the sun began to be felt, such quantities of vapour were seen to ascend from every part of the plain, that all objects, at a little distance, appeared magnified, and variously distorted. An undulating or tremulous motion in ascending lines was manifest over every part of the

surface. Commencing soon after sunrise it continued to increase in quantity until the afternoon, when it diminished gradually, keeping an even pace with the intensity of the sun's heat. The density of the vapour was often such as to produce the perfect image of a pool of water in every valley upon which we could look down at an angle of about ten degrees. This effect was several times seen so perfect and beautiful as to deceive almost every one of our party. A herd of bisons, at the distance of a mile, seemed to be standing in a pool of water; and what appeared to us the reflected image was as distinctly seen as the animal itself. Illusions of this kind are common in the African and Asiatic deserts, as we learn from travellers, and from the language of poets. They are called by the Persians *sirraub*, "water of the desert;" and in the Sanscrit language, *Mriga trichna*, "the desire or thirst of the antelope." Elphinstone relates *, that at Moujgur, in the kingdom of Caubul, towards evening many persons were astonished at the appearance of a long lake enclosing several little islands. Notwithstanding the well known nature of the country, which was a sandy desert, many were positive that it was a lake, and one of the surveyors took the bearings of it. "I had imagined," says he, "this phenomenon to be occasioned by a thin vapour which is spread over the ground in hot weather in India, but this appearance was entirely different, and on looking along the ground no vapour whatever could be perceived. The ground was quite level and smooth, and the weather very hot. It is only found in level, smooth, and dry places; the position of the sun, and the degree of heat, are not material, for it was afterwards seen in Damaun, when the weather was not hotter than in England." On the frontier of Caubul, Elphinstone saw what he calls a most magnificent mirage,

* Mission to Caubul, p. 179. 4to. Lond.

which looked like an extensive lake, or a very wide river. The water seemed clear and beautiful, and the figures of two gentlemen, who rode along it, were *reflected as distinctly as in real water.* "It is common in our own country," says the London Monthly Review, "for ground-mists to assume the appearance of water, to make a meadow seem inundated, and to change a valley into a lake; but these mists never reflect the surrounding trees and hills. Hence, the *mirage* must consist of a peculiar gas, of which the particles are combined by a stronger attraction of cohesion than the vapours of real water; the *liquor silicum* of the alchymists is decribed as exhibiting, in some circumstances, this glassy surface, yet as being equally evanescent."* It is afterwards suggested, in the same paper, that the gas which occasioned these extraordinary reflections, may probably be the substance of the pernicious wind called Simoom. The explanation here offered will not probably be thought satisfactory. It seems to belong to the epoch of great and brilliant discoveries in pneumatic chymistry, when "a peculiar gas" was thought the agent of every phenomenon.

The images of pools of water, which we saw in the deserts of the Platte, appeared to us similar to those mentioned by Elphinstone, likewise to those observed by Nieburgh in Arabia, where inverted images were seen.

To the more common effects of light passing through a medium charged with vapours, we had become familiar. We had, for many days, seen the low bluffs of the valley of the Platte suspended over the verge of our apparent horizon, as distant capes are suspended over the sea; but in viewing these perfect images of lakes, we could scarce believe they were occasioned by *refraction,* to which the phenomena of mirage have usually been attributed.†

* See Monthly Review for May 1817. p. 3.

† See Humb. Pers. Nar. vol. ii. p. 196. vol. iii. pp. 358. 542.

The circumstance that these pools could only be seen when we looked down at a considerable angle upon some valley; the perfect manner in which the image of the sky was returned from the surface, and the inverted position of the objects seen, induced us to inquire whether the effect might not be produced by reflection from the lower stratum of watery vapour. [13] These appearances are sufficient to justify the conclusion that the quantity of evaporation is much greater here than in less elevated districts of country, where such things are not seen.

Towards evening the air became more clear, and our view of the mountains was more satisfactory, though as yet we could only distinguish their grand outline, imprinted in bold indentations upon the luminous margin of the sky. We soon remarked a particular part of the range divided into three conic summits, each apparently of nearly equal altitude. This we concluded to be the point designated by Pike as the highest peak. Its bearing was taken a short time before we halted for the evening, and found to be south, 73° west. As we were about to encamp, some of the party went in pursuit of a herd of bisons, one of which they killed, and returned to camp a little before sunset.

July 1st. Although the temperature indicated by the thermometer for several days had been about 80°, in the middle of the day, the heat, owing to the cool breezes from the mountain, had been by no means oppressive. On the night of the 30th of June, the mercury fell to 55°, and on the following morning the air was chilly, and a strong breeze was felt before sunrise, from the south-east. We left our camp at a very early hour, and travelling over a tract differing in no respect but its greater barrenness from that passed on the preceding day. We halted to dine at the distance of sixteen and a half miles. Many acres of this plain had not vegetation enough to communi-

cate to the surface the least shade of green; a few dwarfish sunflowers and grasses, which had grown here in the early part of the summer, being now entirely withered and brown. In stagnant pools near the river, we saw the common arrow head, (sagittaria sagittifolia,) the alisma plantago, and the small lemna growing together, as in similar situations in the eastern states.

A striking feature of that part of the plain country, we were now passing, is formed by innumerable ant-heaps, rising from twelve to eighteen inches above the common level of the surface. They occur with some uniformity, at intervals of about twenty feet, and are all similar in size and dimensions. They consist so entirely of small grains of flesh-coloured felspar, that they have, all of them, an uniform reddish aspect, and it is not without careful examination, that any other kind of gravel can be detected in them. The entrance to the interior of each of these little mounds is uniformly on the eastward side, and very rarely occurs beyond the boundaries of N. E. and S. E. It is never at the top, nor on a level with the surface of the soil, but is a little elevated above it. It seems highly probable, that the active little architects thus place the entrance of their edifice on the eastward side, in order to escape the direct influence of the cold mountain winds.

At three o'clock, as we were about to resume our journey, there came on a gentle shower of rain, with wind at east, and low broken clouds. In the afternoon we passed some small ridges of sandstone crossing the river from north to south, but very inconsiderable in point of elevation and extent. We travelled this day twenty-seven miles, directly towards the base of the mountains, but they appeared almost as distant in the evening as they had done in the morning. The bearing of the high peak above mentioned, from our encampment, was south, 75° west.

The ensuing day being Sabbath, was devoted to rest. About our camp, which was in the most fertile spot we could select, in a ride of several miles, there was but a very insufficient supply of grass for our horses. A species of cone flower, (rudbeckia columnaris, N.) was here beginning to expand. The showy R. purpurea, very common on the Missouri, and the lower part of the Platte, does not extend into the desolate regions. The common purslane (portulacca oleracea) is one of the most frequent plants about the base of the Rocky Mountains, particularly in places much frequented as licks by the bisons and other animals.

From this encampment, we had a plain but still distant view of the mountains. No inequality occurs in the surface of the subjacent country on the east of the mountains, so that our view was wholly unobstructed. They stretched from north to south like an immense wall, occupying all that portion of the horizon lying to the north-west, west, and south-west. We could now see the surface of the plain, extending almost unvaried to the base of the first ridge, which rises by an abrupt ascent above the commencement of the snow.

A set of observations for longitude was commenced in the morning, but the weather becoming cloudy, we were prevented from completing them. In the afternoon a storm came on from the north, which continued during the night. Much rain fell, accompanied with thunder and high but variable winds. Between twelve o'clock and sunset, the mercury in Fahrenheit's thermometer fell nineteen degrees, from 89° to 60°.

3d. Breakfast was despatched, and we had mounted our horses before five o'clock. We were enabled to have our breakfast thus early, as the sentinel on duty during the night, was directed to put the kettles over the fire at three o'clock, all the processes pre-

paratory to boiling having been finished on the preceding evening.

As we approached the mountains, wood became much more abundant along the Platte. We had often heard our guide, in speaking of the country, two or three days' journey from the mountains, mention the Grand Forest, and were a little surprised on arriving at it, to find no more than a narrow but uninterrupted stripe of timber, extending along the immediate banks of the river, never occupying the space of half a mile in width.

For several days the direction of our course in ascending the Platte, had inclined considerably to the south, varying from due west to south, 20° west.

In the course of the day, we passed the mouths of three large creeks, heading in the mountains, and entering the Platte from the north-west. One of these, nearly opposite to which we encamped, is called Potera's creek, from a Frenchman of that name, who is said to have been bewildered upon it, wandering about for twenty days, almost without food. He was then found by a band of Kiawas, who frequent this part of the country, and restored to his companions, a party of hunters, at that time encamped on the Arkansa.

Throughout the day we were approaching the mountains obliquely, and from our encampment at evening, we supposed them to be about twenty miles distant. Clouds were hanging about all the higher parts of the mountains, which were sometimes observed to collect together, and descend in showers, circumscribed to a limited district. This state of the weather obstructed the clearness, but added greatly to the imposing grandeur of some of the views which the mountain presented.

4th. We had hoped to celebrate our great national festival on the Rocky Mountains; but the day had arrived, and they were still at a distance. Being extremely impatient of any unnecessary delay, which

prevented us from entering upon the examination of the mountains, we did not devote the day to rest, as had been our intention. We did not, however, forget to celebrate the anniversary of our national independence, according to our circumstances. An extra pint of maize was issued to each mess, and a small portion of whiskey distributed.

On leaving the camp in the morning, Major Long and Lieutenant Swift preceded the party, intending to select a suitable place for encampment, where they proposed to commence a set of observations, and to wait the arrival of the remainder of the party. But as they had gone forward about two miles, the point of woods at which they had left the course was mistaken by the main body, which moved on until about eleven o'clock. By this time much anxiety was felt on account of their absence, and persons were sent out to attempt to discover them, but returned unsuccessful. A circumstance tending to increase the anxiety which was felt, was, that Indians were reported to have been seen in the course of the morning by several of the party. Captain Bell was about to despatch as large a force as it was thought prudent to spare from the camp, to search for them in all the distance which had been passed since they were seen, when they arrived at the encampment of the main body, at half past one P. M.

The observations which had been made were, of course, lost, as the corresponding equal altitudes for the correction of time could not be had.

In the evening, the meridional altitude of Antares was taken for latitude.

Several valuable plants were here collected, and, among others, a large suffruticose species of lupine. The long-leaved cotton-wood * of Lewis and Clarke, which is, according to their suggestion, a species of populus, is here of very common occurrence. It is

* Populus angustifolia, J.

found intermixed with the common cotton-wood, resembling it in size and general aspect. Its leaves are long and narrow; its trunk smoother, and its branches more slender and flexile than those of the populus angulata. Some of its fruit was fortunately still remaining, affording us an opportunity to be entirely satisfied of its relation to this genus.

Here we also observed both species of the splendid and interesting Bartonia, the B. nuda in full flower, the ornata not yet expanded.

These most singular plants are interesting on several accounts, particularly the regular expansion of their large and beautiful flowers towards the evening of several successive days. In the morning the long and slender petals, and the petal-like nectaries, which compose the flower, are found accurately closed upon each other, forming a cone of about an inch in length. In this situation they remain, if the weather be clear, until about sunset, when they gradually expand. If the weather be dark and cloudy, with a humid atmosphere, they are awakened from their slumbers at an earlier hour. We have, in some instances, seen them fully expanded early in the afternoon; but this has always been in stormy or cloudy weather. In this particular the Bartonia bears some resemblance to the great night-flowering cereus, to which it is closely allied; but the gaudy petals of the cereus, once unfolded, fall into a state of irretrievable collapse, whereas, the Bartonia closes and expands its flowers for many days in succession. [14]

A number of young magpies were seen in the bushes about the river; also the nests and young of the mocking-bird, (turdus orpheus, Vieil.)

The prairie-dog villages we had observed to become more frequent and more extensive as we approached the mountains; and we had now constant opportunities of contrasting the stupendous elevations of the Andes with the humble mounds cast up by this interesting little animal. We observed in the

numerous burrows an appearance of greater antiquity than in those more remote from the mountains. Many of the mounds occupy an extent of several yards in diameter, though of but inconsiderable elevation, and with the exception of the present entrance, overgrown with a scanty herbage, which always marks the area of the prairie-dog villages. Indeed we have observed several large villages, with scarce a trace of vegetation about them. The food of the marmot consisting of grasses and herbaceous plants, it is not perhaps easy to assign a reason for the preference which, in selecting the site of his habitation, he always shows for the most barren places, unless it be that he may enjoy an unobstructed view of the surrounding country, in order to be seasonably warned of the approach of wolves, or other enemies.

Rattle-snakes of a particular species [15] are sometimes seen in these villages. They are found between the Mississippi and the Rocky Mountains, and appear to prefer an unproductive soil, where their sluggish gait may not be retarded by the opposing obstacles of grass and weeds. Whilst exploring Bowyer creek of the Missouri, in the spring of 1820, our party met with six or eight of them during one day's march on the prairie; and on our subsequent journey to the Rocky Mountains, we several times encountered equal, or even greater numbers, in the same space of time. This is the species of serpent which travellers have observed to frequent the villages of the prairie dogs, and to which they have attributed the unnatural habit of voluntary domiciliation with that interesting animal. It is true that the tergeminus, like many other serpents, will secure a refuge from danger in any hole of the earth, rock, or fallen tree that may present itself, regardless of the rightful occupant; but we witnessed no facts which could be received as a proof that it was an acceptable inmate of the dwelling of the arctomys.

From the disparity in the number of plates and scales, and from the greater size of the vertebral spots in this species than in the C. miliaris, we have been induced to consider this as a distinct species. Specimens are in the Philadelphia museum.

On the 5th of July we left our camp at an early hour, and ascended the Platte about ten miles. Here the party encamped for the day; and Mr. Peale and Dr. James, with two riflemen, went out for an excursion on foot, intending to ascend the Cannon-ball creek to the mountains, which appeared to be about five miles distant.

This creek is rapid and clear, flowing over a bed paved with rounded masses of granite and gneiss. It is from a supposed resemblance of these masses to cannon balls that the creek has received its name from the French hunters. The channel is sunk from fifty to one hundred feet below the common level of the plain.

This plain consists of a bed of coarse pebbles, gravel, and sand; and its surface is thinly covered with prickly pears, and a scanty growth of starved and rigid grasses. Among these the hygrometric stipa, (s. juncea, s. barbata,) is extremely troublesome, its barbed and pointed seeds adhering and penetrating, like the quills of the porcupine, into every part of the dress with which they come in contact. The long and rigid awn is contorted or straight, in proportion to the humidity or dryness of the atmosphere; indicating the changes in this respect with the precision of the nicest hygrometer.

The detached party extended their walk about eight miles without finding that they had very considerably diminished the apparent distance to the base of the mountain. They had unluckily forgotten to make any provision for dinner, and now found themselves fatigued and hungry at the distance of eight miles from the encampment of the main body and so far from the mountains, that it was evidently

impossible they should reach them and return on the same day. It was therefore determined to relinquish the attempt, and Mr. Peale was fortunate enough to kill a couple of curlews, which were roasted and eaten without loss of time.

Near the place of this halt they observed some small sandstone ridges similar to those on the Platte below, and collected, among other plants, the species of currant (ribes aureum?) so often mentioned by Lewis and Clarke, the fruit of which formed an important article of the subsistence of their party while crossing the Rocky Mountains. [16]

They also saw about the shelvings of the sandstone rocks, which formed for some distance the banks of the stream, innumerable nests of the cliff swallows, similar to those seen on the Missouri. In returning to the camp by a different route, they were much annoyed by the prickly pears, covering the ground so closely, that their feet were frequently wounded by the thorns, against which their mockasins presented but a very inadequate protection.

Having killed a young antelope, they recrossed the Platte, which was here about three feet deep, and clear, and rapid, and arrived at camp at sun-set.

Here a complete set of observations, for latitude, longitude, &c., had been taken. Major Long and Lieutenant Swift having preceded the party in the morning, and arrived before seven o'clock for that purpose. In the evening, observations were attempted, but without success, as the sky soon became cloudy.

Robins, which we had not seen since we left the Missouri, here occurred in considerable numbers.

On the following morning, soon after leaving the encampment, we crossed Vermilion creek, a considerable tributary from the south. Its upper branches interlock with those of a tributary of the Arkansa. In some part of its course, its valley is bounded by

precipitous cliffs of a red sand-rock, whence the name of the creek.

Our guide informed us that the Indians, a few years since, destroyed every individual of a large herd of bisons, by driving them over the brink of one of these precipices.

Opposite the mouth of Vermilion creek is a much larger stream, from the north-west, which is called medicine-lodge, creek, from an old Indian medicine lodge, which formerly stood near its mouth. A few miles further, on the same side, is Grand Camp creek, heading also in the mountains. About four years previous to the time of our visit, there had been a large encampment of Indians and hunters on this creek. On that occasion, three nations of Indians, namely, the Kiawas, Arrapahoes, and Kaskaias or or Bad-hearts, had been assembled together, with forty-five French hunters in the employ of Mr. Choteau and Mr. Demun of St. Louis. They had assembled for the purpose of holding a trading council with a band of Shiennes. These last had been recently supplied with goods by the British traders on the Missouri, and had come to exchange them with the former for horses. The Kiawas, Arrapahoes, &c. who wander in the fertile plains of the Arkansa and Red river, have always great numbers of horses, which they rear with much less difficulty than the Shiennes, whose country is cold and barren.

The British traders annually supply the Minnetarees or Gros-ventres of the Missouri with goods; from these they pass to the Shiennes and Crow Indians, who, in their turn, barter them with remoter tribes: in this manner the Indians who wander near the mountains receive their supplies of goods, and they give a decided and well founded preference to those which reach them by this circuitous channel, to those which they receive from any other source.

Two miles beyond Grand Camp creek, is the mouth of Grape creek, and a little above, on the

opposite side, that of Defile creek, a tributary to the Platte, from the south, which has its course in a narrow defile, lying along the base of the mountains.

At eleven o'clock we arrived at the boundary of that vast plain, across which we had held our weary march for a distance of near one thousand miles, and encamped at the base of the mountain. The woodless plain is terminated by a range of naked and almost perpendicular rocks, visible at a distance of several miles, and resembling a vast wall, parallel to the base of the mountain. These rocks are sandstone similar in composition and character to that on the Cannon-ball creek. They emerge at a great angle of inclination from beneath the alluvial of the plain, and rise abruptly to an elevation of one hundred and fifty or two hundred feet. Passing within this first range, we found a narrow valley separating it from a second ridge of sandstone, of nearly equal elevation, and apparently resting against the base of a high primitive hill beyond. At the foot of the first range, the party encamped at noon, and were soon scattered in various directions, being eager to commence the examination of that interesting region.

Our camp was immediately in front of the chasm, through which the Platte issues from the mountains. A little to the south is a commanding eminence, from which the annexed view was taken.

CHAPTER VII.

SANDSTONE FORMATION AT THE BASE OF THE ROCKY MOUNTAINS. — THE PLATTE WITHIN THE MOUNTAINS. — GRANITIC MOUNTAINS BETWEEN THE PLATTE AND ARKANSA. — CASTLE ROCK. — BIRDS. — PLANTS.

THE district occupied by the inclined sandstone, at the base of the mountains, we found much wider, and the rocky summits incomparably more elevated, than from a remote view we had supposed.

July 6. This extensive range, rising abruptly from the plain, skirts the base of the mountains like an immense rampart, and to a spectator placed near it, intercepts the view of the still more grand and imposing features of the granitic ridge beyond. It is made up of rocks composed of the broken down and comminuted fragments of pre-existing aggregates, embosoming reliquæ of the animals of a former world, known to us only by the monuments which these remains exhibit. Though rugged and precipitous, its elevation is small, when compared to that of the stupendous Andes, which rise above it far into the regions of perpetual winter. The stratifications with which it is distinctly seamed, penetrate the mass with various degrees of obliquity, sometimes running perpendicularly to the horizon; seeming unequivocally to prove, that the whole has receded from its original position, and that these immense rocky masses have, by the operation of some powerful agent, been broken off from their original continuity with the strata now found in a horizontal position in the plains.

It is difficult, when contemplating the present appearance and situation of these rocks, to prevent the

imagination from wandering back to that remote period, when the billows of an ocean lashed the base of the Andes, depositing, during a succession of ages, that vast accumulation of rounded fragments of rocks, alternating with beds of animal remains, which now extends without interruption from the base of this range to the summits of the Alleghany mountains; and endeavouring to form some idea of that great subsequent catastrophe, by which this secondary formation has so changed its elevation, in relation to the primitive, that its margin has been broken off and thrown into an inclined or vertical position.

The valley which intervenes between this huge parapet of sand-rock and the first range of the primitive is nearly a mile in width; it is ornamented with numerous insulated columnar rocks, sometimes of a snowy whiteness, standing like pyramids and obelisks, interspersed among mounds and hillocks, which seem to have resulted from the disintegration of similar masses. This range of sandstone would appear to have been originally of uniform elevation and uninterrupted continuity, running along the base of the mountains from north to south; but it has been cut through by the bed of the Platte, and all the larger streams in their descent to the plains.

From our camp, we had expected to be able to ascend the most distant summits then in sight, and return the same evening; but night overtook us, and we found ourselves scarcely arrived at the base of the mountain. The lower part of the sandstone stratum, being exposed at the western declivities of the hills, and in the parts nearest the granite, contains extensive beds of coarse conglomeratic, or pudding-stone, often of a reddish colour. The more compact parts of the rock contain the remains of terebratulæ, and other submarine animals. Among these, few are entire or in good preservation. We observed here several singular scorpion-like, spider-formed

animals, inhabiting under stones and dried bisons' dung. They have a formidable appearance, and run actively. They belong to the class arachnoides, genus galeodes, which has been heretofore observed only in warm climates; not one was known to inhabit this continent.[17]

About the sandstone ledges we collected a geranium [18] intermediate between the crane's-bill and herb-robert, the beautiful calochortus (C. elegans, Ph.) and a few other valuable plants.

The Platte, at the foot of the mountains, is twenty-five yards wide, having an average depth of about three feet, its water clear and cool, and its current rapid. Its descent for twenty miles below cannot be less than ten feet per mile. Its valley is narrow and serpentine, bounded by steep and elevated hills, embosoming innumerable little lawns, often of a semi-circular form, ornamented by the narrow margin of shrubbery along the Platte.

The narrow valley between the ridges of sandstone is a little more fertile than the plains along the river. It is covered with fine and short grasses, and is varied with here and there a copse of small oaks or hazels. There are also some columnar masses of white sandstone, twenty or thirty feet high, standing remote from each other, having the *débris* around their bases covered with shrubby oaks. As we were passing near one of these, an uncommonly large and beautiful buck deer sprung out from the bushes, and stood gazing on us, until he received in his side the ball, which brought him instantly to the earth..

We observed here the obscure wren, [19] a bird more closely related to the great Carolina wren of Wilson than any other we have seen; but the characters drawn from the primaries, and from the marking of the tail, sufficiently distinguish it from that species. The bill is somewhat longer, and the general tint of the plumage of a much more sombre hue. It frequents the arid country in this vicinity,

and is often seen hopping about upon the branches, and singular compressed semi-procumbent trunks of the juniperus depressa. The bill of this species approaches the form which characterizes the genus certhia, in which Wilson has placed its kindred species, the Carolina wren.

On the morning of the 7th of July, the party remaining in the encampment of the preceding day, Dr. James and Mr. Peale, accompanied by two riflemen, were sent out to examine the mountains. These appeared most accessible on the north side of the river, opposite our encampment. The river was here about four feet deep, and the strength of the current such as to render it impossible for a man to keep his feet in the deepest part of the stream. As some of the party destined for the mountains could not swim, it was thought hazardous for them to attempt to cross the river by fording. To obviate this difficulty, two men were sent with a long rope, which they were directed to stretch across the river, making the ends fast on either shore. This was readily accomplished, one of the men swimming across with an end of the rope in his teeth. By the aid of this, the detachment were enabled to keep their feet in crossing, though with extreme difficulty, as the bed of the river was uneven and rocky. They all, however, arrived in safety on the left-hand bank by about sunrise.

After passing the region of inclined sandstone, which is about two miles in width, they began to rise upon what may be considered the base of the mountain. As the day advanced, the heat became oppressive, and they found themselves somewhat exhausted before they had crossed the sandstone hills, which appeared so inconsiderable from our encampment, that the labour of crossing them had been almost forgotten in estimating the toils of the day. The first range of primitive rocks they found far more abrupt and rugged than what they had already passed. Its sides are destitute of vegetation, except a few prickly

pears and yuccas, with here and there a stinted oak or juniper, and so steep that great exertion as well as the utmost caution, are necessary in ascending.

The rock is an aggregate of felspar and hornblende, approaching in character some of the common varieties of sienite. On the eastern side, where the felspar is in the greatest proportion, it is flesh-coloured, and its structure crystalline; the fractured surface of the mass being uneven like that of coarse granite. Advancing towards the west, hornblende was found to become more and more predominant, and so arranged as to have in the mass a laminated appearance. The natural fissures or cleavages between the lamina run nearly in a perpendicular direction, giving the rock the columnar structure of trap or greenstone.

As the detachment proceeded, a few interesting insects and plants occurred to reward their labours. But these impenetrable and naked rocks, are the abodes of few living beings, either animal or vegetable. In the crevices of the rocks where a scanty soil has accumulated, is here and there planted a hardy evergreen, whose short and gnarled trunk, recurved and inflexible branches, proclaim the storms it has withstood, and the centuries during which it has vegetated.

The design of the party had been to cross the first range of the mountains and gain the valley of the Platte beyond, but this they found themselves unable to accomplish. After climbing successively to the summit of several ridges which they had supposed to be the top of the mountain, they still found others beyond higher and more rugged. They therefore relinquished the intention of crossing, and began to look for the best way to descend to the bed of the river, which lay on their left hand. Here they halted to rest for a few moments, and exposed a thermometer in the shade of a large rock. The mercury fell to 72°; in camp, at the same hour it stood at

86°. They were so much elevated above the river, that although they could see it plainly, it appeared like a small brook of two or three yards in width, and though white with foam and spray, caused by the impetuosity of its current, and the roughness of its channel, its "idle chiding could not be heard so high." They could distinguish two principal branches of the Platte — one coming from the north-west, the other from the south; a little below the confluence of these branches, the river turns abruptly to the S. E., bursting through a chasm in a vast mural precipice of naked columnar rocks.

About noon the detachment commenced their descent, which cost them no less exertion than their ascent in the morning. Their fatigue was aggravated by thirst, as they met with no water, nor any shade excepting that of projecting rocks in the higher parts of the mountain.

They chose a different route from that which they had taken in ascending, intending to descend to the river, with the hope of being able to travel along its bed. They were obliged to assist each other in lowering themselves down precipices; they would have found it impossible to pass singly. On the southern declivity of the mountain, they met with a few ripe currants, but these were hard and juiceless, of a sweetish taste, and aggravated, instead of alleviating their thirst, and were probably the cause of a violent head-ache, with which several of the party were affected soon after eating them. There were also found a few large and delicious raspberries. of a species approaching the flowering raspberry (rubus odoratus), but with smaller leaves, and a more branching stem.

After descending from the more precipitous parts about the summit of the mountain, they crossed along a rugged tract, buried and rendered almost impassable by boulders and fragments which had fallen from above, and were at length so fortunate as to

find a spring of cool water, and a shade, in a narrow ravine; where they sat down to rest and dine on the provision they had brought.

The men who were with them stopped in the same ravine, a few rods below. One of these was violently attacked, immediately after drinking of the water, with head-ache, vomiting, and purging, which increased to such an alarming degree, that he was presently unable to stand upon his feet. As it was feared he would not soon be able to walk, Mr. Peale undertook to return alone to camp, and give notice of his situation, and return with medicine and assistance.

He descended along a rough and obstructed ravine, until he arrived at the Platte, but found the valley so confined as to be impassable, and again directed his course towards the north-east, attempting to regain the route which the party had taken in ascending. After a most rugged and fatiguing march of about six miles, he arrived at camp late in the afternoon. Here he found a number of the party suffering in a similar manner, but not so severely as the man he had left in the mountains. Two men were immediately despatched in search of the disabled party.

Mr. Peale had left them but a short time, when their attention was called to the noise as of some large animal running up the narrow defile in which they were sitting; on turning round they perceived a large bear advancing at full speed towards the place where they were. Seizing their rifles, they fired upon him at the distance of about ten steps, but the bear, without stopping or turning his head, mounted an almost perpendicular precipice of about thirty feet, and was out of sight in an instant.

At this spot, which was several miles within the mountains, and elevated nearly to the limit of phænogamous vegetation, the common hop (H. lupulus) was growing in perfection; also the box elder (acer negundo, Ph.), the common sarsaparilla of the eastern

States (aralia nudicaulis), the spikenard (A. vacemora), and many other common plants.

After waiting about two hours, they found the sick man so far recovered as to be able to stand upon his feet and walk a little. They therefore relieved him of his gun and other luggage, and moved by short stages towards camp, where they arrived at a late hour in the evening. [20]

The men who had been sent out to their assistance returned some time afterwards, having sought for them without success.

On the morning, soon after the departure of Dr. James's detachment, two of the party passed into the mountains on the left side of the river; they experienced much difficulty, and underwent much labour in scaling the steep ascents, and some hazard in descending the precipitous declivities which marked their course. The timber was small, scrubby, and scattered in the most favoured situation; and many of the solitary pines which occupied an elevated position, had evidently been the sport of furious tempests, being rived and seamed by lightning. Upon surmounting one of the elevations, they observed on a projecting ledge of the succeeding mountain two elk grazing, which seemed to be at a very short distance; and in consequence of this deceptive appearance were magnified into a vast size. The party were surprized at the apparent heedlessness of these animals, which remained peacefully feeding, whilst the party was clambering along the rocks in full view, until at length they majestically bounded off, leaving the authors of their alarm to measure the unexpected distance to the position they had occupied. To the right, and easy of access, was a projecting rock supporting a single humble cedar in one of its fissures, from which a stone let fall was received into the torrent of the river which washed its base. The huge rampart of naked rock which had been seen from below to stretch across

the valley, was now in nearer view, the river whirling abruptly around the acute angle of its extremity, and offering at its superior edge an embattled outline. They ascended a primitive mountain, which seemed to be of a superior elevation, in order to overlook the western ranges; but found their horizon bounded by the succeeding mountains towering majestically above them. To the east, over the tops of a few inferior elevations, lay expanded the vast interminable prairie over which we had so long held our mountainous march. The undulations which swell its surface now disappeared, and the whole lay like a map before the observer. They could trace the course of the Platte, and number the streams they had crossed, and others which they had before passed near, by the slight fringing of timber or bushes which margined their banks, and by an occasional glimpse of their streams shining like quicksilver, and interrupting and varying the continuity of the plain as they pursued their serpentine course. The atmosphere was remarkably serene, small clouds were coursing over the surface of the heavens, casting their swiftly moving shadows upon the earth, and enhancing the beauty of the contrast which the long lines of timber afforded to the general glare of light. After contemplating for some time the beauty and extent of the scene, their attention was attracted by a moving point, which occasionally became visible by reflecting the rays of the retiring sun. This object was our white flag, waving in a gentle breeze, and revealing the position of our camp, the only spot in the boundless landscape where the eye could rest on the work of human hands. The descent towards the river from this pinnacle was so precipitous, that much caution was requisite in attempting to gain the river towards which they now directed their course. Upon a step or resting place were several ponderous masses of rock, which, by the application of a little force, were readily overturned down the steep; and

we were amused by marking their impetuous and rapidly increasing motion as they rolled and bounded onward, until a surge and wide-thrown spray announced their reception into the bed of the river. Arriving at the river, it was found necessary to pass along in the stream, the margin not admitting sufficient foot-hold; this mode of progression, however, soon proved too painful and laborious, as the very unequal rocks with which the bottom was paved, were invested with a slime, and refused repose to the foot, the uncertain motion of which was only arrested by the opposition of an angular fragment, or the intervention of an interstice; we therefore again ascended the mountain side, and at length regained the plain.

Astronomical observations were attempted at camp, but in the middle of the day the moon was found to be too near the sun, and in the evening the sky was cloudy.

The sickness experienced by almost all the party was probably occasioned by eating of currants, which were abundant about the camp. It is not to be supposed this illness was caused by any very active deleterious quality in the fruit, but that the stomach, by long disuse, had in a great measure lost the power of digesting vegetable matter. Several continued unwell during the night.

On the morning of the 9th of July we resumed our journey, travelling somewhat east of south along a small tributary of the Platte. The bed of this stream lies from south to north along a narrow valley, bounded on each side by high cliffs of sandstone. The rock is similar to that already mentioned, its strata having, however, less inclination than is observed nearer the base of the mountain. It is the margin of that great formation of secondary which occupies the plain, and appears as if broken off and thrown into an inclined position by some convulsion which changed the relative elevation of

the stratum. It is of great thickness, its laminæ in an almost vertical position, covering a surface of two or three, and sometimes many miles in width. On the eastern declivities of the first ranges of hills in places which may be supposed to have occupied the surface of the stratum in its original position, the rock is usually of a close grain and compact texture, and of a yellowish white or light gray colour.

We observed, in various parts of the vallies which traverse this sandstone district, several detached columnar masses, many of them bearing a striking resemblance to colossal ruins; also some insulated hills with perpendicular sides and level summits. These seem to be the remains of an extensive portion of the sandstone stratum which formerly covered the country to the level of their highest summits. They occur at considerable distance from the base of the primitive mountain, and their summits are occupied by horizontal strata of sandstone; for a small portion of the upper part of their elevation their sides are nearly perpendicular, but their bases are surrounded by an extensive accumulation of *débris* sometimes rising nearly to the summit. After ascending the small stream before mentioned to its source, we crossed an inconsiderable ridge which separates it from the valley of Defile Creek. This we ascended to the place where its principal branch descends from the mountains. Here we encamped with the intention of resting on the following day, which was Sunday.

July 10th. A beautiful species of pigeon was shot near the mountain. The head is of a purplish cinereous colour; the back of the neck, and its sides, brilliant golden-green; the feathers at base brownish purple; above this patch, and at base of head, is a white semi-band; the under part of the neck is pale vinaceous purplish; this colour becomes paler as it approaches the vent, which, with the inferior tail coverts, is white; anterior portion of the back, the

wing coverts and scapulars are brownish ash; the larger wing feathers dark brown, approaching black; the exterior edges whitish; the lower part of the back, the rump and tail coverts, inferior wing coverts and sides, bluish ash; paler beneath the wings; the shafts of the body-feathers and tail coverts are remarkably robust, tapering rather suddenly near the tips; the tail is medial, rounded at tip, consisting of twelve feathers, a definite black band at two-thirds their length from the base, before which the colour is bluish ash, and behind it dirty whitish; the bill is yellow, tipped with black, and somewhat gibbous behind the nostrils; the irides red; the feet yellow; claws black.

This species seems to be most intimately connected to the ring-tailed pigeon (C. caribæa), from which it differs in the colour of the legs and bill, and in not having the gibbosity at the base of the latter so remarkable. It is possible that it may be an intermediate link between the ring-tailed pigeon and the stock pigeon of Europe, with the latter of which it has, in common, the exterior white edging to the greater wing feathers. It may be distinguished by the name of band-tailed pigeon (columba fasciata, Say); and may be seen, with other specimens of natural objects collected on this expedition, in the Philadelphia Museum.

Several of the tributaries to Defile creek appear to discharge as much water as is seen in the stream below their junction. This appearance is common to many of the larger creeks, their broad and sandy beds allowing much of the water to sink, and pass off through the sand. In the evening, a favourable opportunity, the first for several days, presented, and observations for latitude were taken.

That part of Defile creek, near which we encamped, is filled with dams, thrown across by the beaver, causing it to appear rather like a succession of ponds than a continued stream. As we ascended

farther towards the mountains, we found the works of these animals still more frequent. The small willows and cotton-wood trees, which are here in considerable numbers, afford them their most favourite food.

At no great distance to the east of our camp was one of these peculiar hills above mentioned. In visiting it we crossed a ridge of sandstone, about three hundred feet in height, with strata inclined to the west. To this succeeds a valley, about one mile wide, having a scanty growth of pine and oak. The ascent of the hill is steep and rugged. Horizontal strata of sandstone and coarse conglomerate are exposed on its sides, and the summit is capped by thin stratum of compact sandstone, surmounted by a bed of greenstone trap, or trappea porphyry. The loose and splintery fragments of this rock sometimes cover the surface, making a clinking noise under the feet, like fragments of pottery.

The summit of this hill is of an oval form, about eight hundred yards in length and five hundred in breadth. Its surface is undulating, and is terminated on all sides by perpendicular precipices. The elevation of the hill is about one thousand feet, and the height of the perpendicular precipices, from the summit of the *débris* to the top of hill, about fifty.

From the top of this hill, the high peak mentioned by Captain Pike, was discovered, and its bearing found to be S. 50. E.

Several of the party ascended Defile creek until they arrived at the mountains, into which they penetrated as far as was found practicable. As they travelled along the bed of this, they found the several rock formations beautifully exposed, and in the following order.

Commencing from the alluvial of the plain on the east, they saw:

First, Horizontal sandstone, embracing extensive

beds of coarse conglomeratic, and commonly of a light gray or reddish yellow colour.

Second, Fine compact gray sandstone, containing a few impressions of organized remains, resembling those in the sandstones of coal formations. This rock is inclined at an angle of near twenty degrees towards the west. It forms continuous ranges of hills, not difficult of ascent from the east, but their western declivities are abrupt and precipitous.

Third, Lofty and detached columns of sandstone, of a reddish or deep brown colour. These are irregularly scattered throughout a narrow untimbered valley. Some of them rise probably three hundred feet above the common level of the plain, and are so steep on all sides as to preclude the possibility of ascent. Others are accessible at some points, and one of these we ascended. Sketches of these singular rocks have been preserved both by Mr. Peale and Mr. Seymour.

Fourth, Coarse white pudding-stone or conglomeratic and sandstone, of a deep red colour, alternating with each other, and with beds of fine white sandstone, and resting against the granite in a highly inclined position. This rock contains well preserved remains of terebratulæ, productus, and other bivalve shells. These are usually found on or near the surface of large nodules of a fine flinty stone, closely resembling petrosilex. The same rock also contains an extensive bed of iron ore; and from its eastern side flows a copious brine spring.

About this spring, which had evidently been much frequented by animals, we saw the skulls of the male and female big horn, the bones of elk, bisons, and other animals.

The granite, which succeeds the sandstone last mentioned, is of a dark reddish brown colour, containing a large proportion of felspar, of the flesh-coloured variety, and black mica. The crystalline grains, or fragments of the felspar, are large, and

detached easily, so that the rock is in a state of rapid disintegration. This granite rises abruptly in immense mountain masses, and undoubtedly extends far to the west.

The little river, on which our camp is situated, pours down from the rugged side of the granitic mountain through a deep inaccessible chasm, forming a continued cascade of several hundred feet. From an elevation of one or two thousand feet on the side of the mountain, we were able to overlook a considerable extent of secondary region at its base. The surface appeared broken for several miles; and in many of the valleys we could discern columnar and pyramidal masses of sand-rock, sometimes entirely naked, and sometimes bearing little tufts of bushes about their summits.

Here met with a female bird, which closely resembles, both in size and figure, the female of the black game (tetrao tetrix); it is, however, of a darker colour, and the plumage is not so much banded; the tail also seems rather longer, and the feathers of it do not exhibit any tendency to curve outward, which, if we mistake not, is exhibited by the inner feathers of the tail of the corresponding one of the black game.

Its general colour is a black brown, with narrow bars of pale ocraceous; plumage near the base of the beak above tinged with ferruginous; each feather on the head, with a single band and slight tip, those of the neck, back, tail coverts, and breast, two bands and tip, the tips on the upper part of the back and on the tail coverts are broad and spotted with black, with the inferior band often obsolete; the throat and inferior portion of the upper sides of the neck are covered with whitish feathers, on each of which is a black band or spot; a white band on each feather of the breast, becoming broader on those nearer the belly; on the belly, the plumage is dull cinereous with concealed white lines on the shafts;

the wing coverts and scapulars, about two banded with a spotted tip and second band, and with the tip of the shaft white; the primaries and secondaries have whitish zigzag spots on their outer webs, the first feather of the former short, the second longer, the third, fourth, and fifth equal, longest feathers of the sides with two or three bands and white spot at the tip of the shaft; inferior tail coverts, white with a black band and base, and slightly tinged with ocraceous on their centres; legs feathered to the toes, and with the thighs pale, undulated with dusky; tail rounded with a broad terminal band of cinereous, on which are black zigzag spots; on the intermediate feathers are several ocraceous spotted bands, but these become obsolete and confined to the exterior webs on the lateral feathers, until they are hardly perceptible on the exterior pair; a naked space above and beneath the eyes. It may be distinguished by the name of the Dusky Grouse (tetrao obscurus, S.).

When this bird flew, it uttered a cackling note a little like that of the domestic fowl; this note was noticed by Lewis and Clarke in the bird which they speak of under the name of the cock of the plains, and to which Mr. Ord has applied the name of tetrao fusca; a bird which, agreeably to their description, appears to be different from this, having the legs only half booted; the "fleshy protuberance about the base of the upper chop," and "the long pointed tail" of that bird may possibly be sexual distinctions.

It appears by the observations of Lewis and Clarke, that several species of this genus inhabit the country which they traversed, particularly in this elevated range of mountains, from whence, amongst other interesting animals, they brought to Philadelphia a specimen of the spotted grouse (T. canadensis); which, together with the above described bird, are now preserved in the Philadelphia Museum, thus proving that the spotted grouse is an inhabitant of a portion of the territory of the United States.

In the evening, a thunder-storm rose in the east. It appeared for some time to approach, the thunder being loud and frequent, but at length moved off towards the south-east, continuing visible in the horizon during great part of the night.

July 11th. From our encampment we travelled nearly south, and crossing a small ridge dividing the waters of the Platte from those of the Arkansa, we halted to dine on a tributary of the latter river. In an excursion from this place, we collected a large species of columbine, somewhat resembling the common one of the gardens. It is heretofore unknown to the flora of the United States, to which it forms a splendid acquisition. If it should appear not to have been described, it may receive the name of aquilegia cœrulea. [21] Our road during the morning lay for about twelve miles close along the foot of the primitive mountain, having on our left some of the sandstone ridges and hills already described. On our right, the brown and naked granite rose in shapeless masses far above our heads; and occasionally, as we passed the deep fissures worn by the descending torrents, we caught a view of the distant summits glittering with eternal frosts. In the valleys towards the east were many insulated and lofty hills, with perpendicular sides, and level table-like summits. They are sometimes disposed in parallel, but interrupted ranges, and sometimes irregularly scattered, without any appearance of order. In every instance they were found to be the remains of extensive beds of sandstone; insulated portions of which had been preserved from disintegration, while all the contiguous parts had crumbled down and been washed away.

One of these singular hills, of which Mr. Seymour has preserved a sketch, was called the Castle Rock, on account of its striking resemblance to a work of art. It has columns, and portions and arches, and

when seen from a distance has an astonishingly regular and artificial appearance.

July 12th. On approaching it, the base is found enveloped in an extensive accumulation of soil, intermixed with fragments of rapidly disintegrating sandstone. The lower portions of the perpendicular sides of the rock are of loosely cemented pudding-stone, but the summit is capped by a compact and somewhat durable sand-rock. This is surmounted by a scanty soil, in which are a few stinted oaks and junipers.

We had seen no bisons for several days, but in the afternoon a few were discovered at a distance from our course, and three men despatched in pursuit of them. They were grazing on the side of a hill near a mile distant. As provisions were growing scarce with us, we watched the progress of the hunters with some anxiety. At length the firing commenced, and we enjoyed a distant, though distinct view of the animating spectacle of a bison hunt. In a short time the hunters joined us with their horses loaded with meat.

We halted to dine on the tributary of the Arkansa before mentioned, nearly opposite the Castle Rock. Intermixed with the grass upon which we sat down to our dinner, we observed a small campanula, with a solitary terminal flower, about as large as that of the common hare-bell (C. decipiens). This species we believe to be identical with the C. uniflora of Europe, which has not been heretofore noticed in the United States.

In the afternoon we moved on, descending the little stream on which we had halted for dinner. Like the small branches of the Platte, it is inhabited by great numbers of beavers; but it has more timber, and a more fertile soil than any stream of similar magnitude we had lately passed. Some light showers occurred in the middle of the day, and at evening a thunder-storm was observed, in the same manner

as on the preceding day, to collect in the east, and after we had listened to its thunders for some time, it moved off in the direction of the Arkansa, but no rain fell where we were. In the course of the day several elk were seen, and at evening we killed an antelope. Robins are here frequent, and a jerboa was seen resembling the gerbillus canadensis; many fine plants were collected, several of which are hitherto undescribed. [22]

Towards evening, our guide discovered we had already passed considerably beyond the base of the peak, near which it had been our intention to halt. He also perceived at the same moment, he had arrived at the very spot where some years ago he had been made prisoner by a party of Spaniards, who took him to Santa Fé. As we were particularly desirous of visiting the mountains at the point designated in many maps as the "highest peak," we resolved to return upon our course, but as it was now near sunset, we thought it advisable to encamp for the night.

Our journey in the afternoon had been pursued in a bison path, and although not in the direction of our proper course, and served only to prolong our march without advancing us towards the end of our pilgrimage, yet it brought us near to that romantic scenery which for many days we had chiefly contemplated with a distant eye. We entered the secondary range along the margin of a deep ravine, which wound with a serpentine course towards the base of the mountain. Our progress was sometimes impeded by huge rocky masses which had been precipitated from some neighbouring height; and sometimes by a dense forest of very limited extent, or an immense impending wall or oblique buttress of rock, which, by its proximity to the eye, vied with the grandeur of the ascending piles beyond.

July 12th. On the morning of the 12th we retraced our path of the preceding day, until a small

stream running towards the north-east offered us a change of scenery, and a course more in the direction we wished to pursue. The inequalities of the surface were greater than in the route of the preceding evening. The precipitous character of several of the passes thoroughly tested the confidence we felt in our sure-footed, but now wearied and exhausted Indian horses and mules. Our rude pathway skirted along the base of an elevated ridge, on whose side, far above our heads, projected a narrow ledge of rocks, frowning defiance to all attempts to scale the steep. This ledge declined gradually as we proceeded, until it terminated abruptly on the edge of a profound gulph. Here appeared to be the only spot at which the ridge could be ascended. On the brow of the cliff, a fragment of rock and a small portion of earth were suspended by the binding roots of a solitary pine, offering a frail and precarious foothold. This we chose to ascend, startling and hazardous as the attempt appeared, rather than retrace our steps for several miles, and search for a passage in some other direction. The projecting ledge by which we had ascended, had barely sufficient width to admit the passage of a single individual at a time. When we had gained the summit, we allowed our exhausted animals a moment's rest in the partial shade of some straggling oaks, and contemplated, not without a feeling of terror, the yawning gulph at our feet. This emotion was much enhanced by reflecting, that a single misstep of a horse, or the sliding of a fragment of stone in our narrow path, would have been sufficient to have precipitated us into the abyss. We thus pursued our route, marked out to us by the bisons, who always trace the most direct and best course, until turning the side of a mountain of moderate elevation, the ocean of prairie again spread before us. This monotonous plain, of which we had been hitherto so weary, now burst upon the sight, and for a mo-

ment exhibited a cheerful and pleasant contrast to the rude mountain ruins, that we had with such toil and hazard been clambering over. This charm was, however, soon to be dispelled. On descending to the plain, it became as usual desirable to find a good situation for an encampment, abounding with grass for the horses, and convenient to a water course. For this purpose, one of the party rode to a small line of timber about a mile on our left, which ran in a parallel direction to our line of march. He overtook us again at the distance of two or three miles, having discovered a copious stream of water. It was about three miles below the point at which the water had been discovered that we gained the line of timber, only to experience the mortification of disappointment in finding a naked bed of sand, the stream having, no doubt, sunk into the earth some distance above. We had, therefore, to undergo the pains of abstenance still longer, until we again sought the timber further below, where the water had reappeared on the surface.

Near this encampment, we first observed the great shrubby cactus* which forms so conspicuous a feature in the vegetable physiognomy of the plains of the Arkansa. Its trunk is six or eight feet in height, and at the root five or six inches in diameter. It is much branched, the ultimate divisions consisting of long cylindric articulations. The flowers are as large as those of the C. ferox, of a purple colour, and are placed on the ends of the articulations. These last are arranged somewhat in whorls about the ends of the smaller branches. The surface of every part of the plant, aside from its terrific armature of thorns, is marked by little prominences of near an inch in length, and about one-fourth of an inch in breadth, rising considerably, and bearing a cluster of radiating spines. These are of various lengths, one pointing

* Cactus cylindricus of Humboldt.

obliquely upward, being commonly much the largest. At their insertion, these thorns are surrounded by pungent setæ in the manner of C. ferox. The whole plant is so thickly beset with strong spines pointing in every direction, that no large animal can approach it unharmed. It does not form thickets, but each plant is a cluster by itself; and when first seen at a distance, they were mistaken for bisons. We were informed by one of our engagees, who had penetrated the Spanish provinces as far as Montesey, that this plant is common there, and its fruit much esteemed. The nopals are considered characteristic of warm and dry climates, like those of Egypt and California. * Perhaps there is no part of the world where plants of this family constitute so large a proportion of the vegetable products of the soil, as in the arid plains of the Arkansa. These plains are sufficiently dry; but like those of the Platte and Upper Missouri, where cacti are almost equally abundant, they are visited by very severe cold in winter.

Another highly interesting plant, which occurs in the most barren and desolate parts of the plain, is a cucurbitaceous vine resembling some of our common squashes, bearing a small pepo, which is round and smooth, and as large as an orange. It is perennial, having a somewhat lignous root four or five inches in diameter, and descending often more than four feet into the earth. We were so fortunate as to meet with it in flower, and also with ripened fruit. It has the acutely margined seed of the genus cucumis, but in other respects is closely allied to cucurbita. [23] In addition to these, we collected the zigadenus elegans, Ph., asclepias tuberosa, and some others.

From an elevated ridge which we passed in the morning, some bisons had been seen, at the distance

* Humboldt's Personal Narrative, vol. i. p. 362. Philadelphia Edit.

of five miles; and as we were in want of game, Mr. Peale, with two hunters, rode forward in the pursuit of them. They overtook the herd near a small creek, and attacked one of the largest, which was at length killed. In examining the body, it was found twenty balls had entered in different parts before the animal fell. They arrived at camp, bringing the meat, at a little after noon.

The small stream on which we encamped had some timber along its valley. In this, four deer had been killed; so that we now had provisions in great plenty. [24]

From this camp we had a distinct view of the part of the mountains called by Captain Pike the highest peak. It appeared about twenty miles distant, towards the north-west. Our view was cut off from the base by an intervening spur of less elevation; but all the upper part of the peak was visible, with patches of snow extending down to the commencement of the woody region.

At about one o'clock P. M. a dense black cloud was seen to collect in the south-west; and advancing towards the peak, it remained nearly stationary over that part of the mountains, pouring down torrents of rain. The thunder was loud and frequent; and though little rain fell near our camp, the creek soon began to swell; and before sunset it had risen about six feet, and again subsided nearly to its former level. When the stream began to rise, it was soon covered with such a quantity of bison's dung, suddenly washed in from the declivities of the mountains and the plains at its base, that the water could scarcely be seen. About this time our cook filled his kettle, and put into it the meat intended for supper; but when the soup was brought to our tent, the flavour of the cow-yard was found so prevalent, and the meat so filled with sand, that very little could be eaten.

As one of the objects of our excursion was to ascertain the elevation of the peak, it was determined to remain in our present camp for three days, which would afford an opportunity for some of the party to ascend the mountain.

CHAPTER VIII.

EXCURSION TO THE SUMMIT OF THE PEAK. — MINERAL SPRINGS. — COQUIMBO OWL. — ENCAMPMENT ON THE ARKANSA.

At an early hour on the morning of the 13th, Lieutenant Smith, accompanied by the guide, was despatched from camp, to measure a base near the peak, and to make there a part of the observations requisite for calculating its elevation. Dr. James, being furnished with four men, two to be left at the foot of the mountain to take care of the horses, and two to accompany him in the proposed ascent to the summit of the peak, set off at the same time.

This detachment left the camp before sunrise, and taking the most direct route across the plains, arrived at eleven o'clock at the base of the mountain. Here Lieutenant Swift found a place suited to his purpose; where, also, was a convenient spot for those who were to ascend the mountain to leave their horses. At this place was a narrow, woodless valley, dividing transversely several sandstone ridges, and extending westward to the base of the peak.

After establishing their horse-camp, the detachment moved up the valley on foot, arriving about noon at the boiling spring, where they dined on a saddle of venison, and some bison ribs they had brought ready cooked from camp.

The *boiling spring* is a large and beautiful fountain of water, cool and transparent, and aërated with carbonic acid. It rises on the brink of a small stream, which here descends from the mountain, at the point where the bed of this stream divides the ridge of sandstone which rests against the base of the first

granitic range. The water of the spring deposits a copious concretion of carbonate of lime [25], which has accumulated on every side, until it has formed a large basin overhanging the stream; above which it is raised several feet. This basin is of a snowy whiteness, and large enough to contain three or four hundred gallons, and is constantly overflowing.

The spring rises from the bottom of the basin, with a rumbling noise, discharging about equal volumes of air and of water, probably about fifty gallons per minute; the whole kept in constant agitation. The water is beautifully transparent; and has the sparkling appearance, the grateful taste, and the exhilarating effect, of the most highly aërated artificial mineral waters.

Distant a few rods from this is another spring of the same kind, which discharges no water, its basin remaining constantly full, and air only escaping from it. We collected some of the air from both these springs in a box we had carried for the reception of plants; but could not perceive it to have the least smell, or the power of extinguishing flame, which was tested, by plunging into it lighted splinters of dry cedar.

The temperature of the water of the larger spring at noon was 63°, the thermometer at the same time, in the shade, stood at 68°; immersed in the small spring, at 67°. This difference in temperature is owing to the difference of situation, the higher temperature of the small spring depending entirely on its constant exposure to the rays of the sun, and to its retaining the same portion of water; while that in the large spring is constantly replaced by a new supply.

After we had dined, and hung up some provisions in a large red cedar-tree near the spring, intending it for a supply on our return, we took leave of Lieutenant Swift, and began to ascend the mountain. We carried with us each a small blanket, ten

or twelve pounds of bison meat, three gills of parched corn meal, and a small kettle.

The sandstone extends westward from the springs, about three hundred yards, rising rapidly upon the base of the mountain; it is of a deep red colour, for the most part compact and fine, but sometimes embracing angular fragments of petrosilex and other siliceous stones, with a few organic impressions. The granite which succeeds to this is coarse, and of a deep red colour; some loose fragments of gneiss were seen lying about the surface, but none in place. The granite at the base of the mountain contains a large proportion of felspar, of the rose-coloured variety, in imperfect cubic crystals. The mass appears to be rapidly disintegrating, under the operation of frost and other causes, crumbling into small masses of half an ounce weight, or less.

The ascending party found the surface in many places covered with such quantities of this loose and crumbled granite, rolling from under their feet, as rendered the ascent extremely difficult. We now began to credit the assertions of the guide, who had conducted us to the foot of the peak, and there left us, with the assurance that the whole of the mountain to its summit was covered with loose sand and gravel; so that, though many attempts had been made by the Indians and by hunters to ascend it, none had ever proved successful. We passed several of these tracts, not without some apprehension for our lives; as there was danger, when the foothold was once lost, of sliding down, and being thrown over precipices. After labouring with extreme fatigue over about two miles, in which several of these dangerous places occurred, we halted at sunset in a small cluster of fir trees. We could not, however, find a piece of even ground large enough to lie down upon, and were under the necessity of securing ourselves from rolling into the brook near which we encamped by means of a pole placed against two trees. In this situation, we

passed an uneasy night; and though the mercury fell only to 54°, felt some inconvenience from cold.

On the morning of the 14th, as soon as daylight appeared, having suspended in a tree our blankets, all our provisions, except about three pounds of bison's flesh, and whatever articles of clothing could be dispensed with, we continued the ascent, hoping to be able to reach the summit of the peak, and return to the same camp in the evening. After passing about half a mile of rugged and difficult travelling, like that of the preceding day, we crossed a deep chasm, opening towards the bed of the small stream we had hitherto ascended; and following the summit of the ridge between these, found the way less difficult and dangerous.

Having passed a level tract of several acres covered with the aspen, poplar, a few birches, and pines, we arrived at a small stream running towards the south, nearly parallel to the base of the conic part of the mountain which forms the summit of the peak. From this spot we could distinctly see almost the whole of the peak: its lower half thinly clad with pines, junipers, and other evergreen trees; the upper, a naked conic pile of yellowish rocks, surmounted here and there with broad patches of snow. But the summit appeared so distant, and the ascent so steep, that we began to despair of acccomplishing the ascent and returning on the same day.

About the small stream before mentioned, we saw an undescribed white-flowered species of caltha, some pedicularіæ, the shrubby cinque-foil (potentilla fruticosa, Ph.) and many alpine plants. At this point a change is observed in the character of the rock, all that which constitutes the peak beyond containing no mica. It is a compact, fine-grained aggregate of quartz, felspar, and hornblende; the latter in small proportion, and sometimes wholly wanting.

The day was bright, and the air nearly calm. As we ascended rapidly, we could perceive a manifest

change of temperature; and before we reached the outskirts of the timber, a little wind was felt from the north-east. On this part of the mountain is frequently seen the yellow-flowered stone-crop (sedum stenopetalum, Ph.), almost the only herbaceous plant which occurs in the most closely wooded parts of the mountain. We found the trees of a smaller size, and more scattered in proportion to the elevation at which they grew; and arrived at about twelve o'clock at the limit above which none are found. This is a defined line, encircling the peak in a part which, when seen from the plain, appeared near the summit; but when we arrived at it, a greater part of the whole elevation of the mountain seemed still before us. Above the timber the ascent is steeper, but less difficult than below; the surface being so highly inclined, that the large masses, when loosened, roll down, meeting no obstruction until they arrive at the commencement of the timber. The red cedar, and the flexile pine *, are the trees which appear at the greatest elevation. These are small, having thick and extremely rigid trunks; and near the commencement of the naked part of the mountain, they have neither limbs nor bark on that side which is exposed to the descending masses of rocks. It may appear a contradiction to assert, that trees have grown in a situation so exposed as to be unable produce or retain bark or limbs on one side; yet of the fact that they are now standing and living in such a situation there can be no doubt. It is, perhaps, probable the timber may formerly have extended to a greater elevation on the sides of this peak than at present, so that those trees which are now on the outskirts of the forest were formerly protected by their more exposed neighbours.

A few trees were seen above the commencement of snow; but these are very small, and entirely procumbent, being sheltered in the crevices and fissures of the rock. There are also the roots of trees to be seen at

* Pinus flexilis. N. S.

some distance above the part where any are now standing.

A little above the point where the timber disappears entirely, commences a region of astonishing beauty, and of great interest on account of its productions. The intervals of soil are sometimes extensive, and covered with a carpet of low but brilliantly-flowering alpine plants. Most of these have either matted procumbent stems, or such as, including the flower, rarely rise more than an inch in height. In many of them the flower is the most conspicuous and the largest part of the plant, and in all the colouring is astonishingly brilliant.

A deep blue is the prevailing colour among these flowers; and the pentstemon erianthera, the mountain columbine (aquilegia cœrulea), and other plants common to less elevated districts, were much more intensely coloured than in ordinary situations. It cannot be doubted, that the peculiar brilliancy of colouring observed in alpine plants, inhabiting near the utmost limits of phænogamous vegetation, depends principally upon the intensity of the light transmitted from the bright and unobscured atmosphere of those regions, and increased by reflection from the immense impending masses of snow. May the deep cerulean tint of the sky have an influence in producing the corresponding colour so prevalent in the flowers of these alpine plants? At about two o'clock we found ourselves so much exhausted as to render a halt necessary. Mr. Wilson, who had accompanied us as a volunteer, had been left behind some time since, and could not now be seen in any direction. As we felt some anxiety on his account, we halted, and endeavoured to apprize him of our situation; but repeated calls, and the discharging of the rifleman's piece, produced no answer. We therefore determined to wait some time to rest, and to eat the provision we had brought, hoping, in the meantime, he would overtake us.

We halted at a place about a mile above the edge of the timber. The stream by which we were sitting we could perceive to fall immediately from a large body of snow, which filled a deep ravine on the south-eastern side of the peak. Below us, on the right, were two or three extensive patches of snow; and ice could be seen everywhere in the crevices of the rocks.

Here, as we were sitting at our dinner, we observed several small animals, nearly of the size of the common gray squirrel; but shorter, and more clumsily built. They were of a dark gray colour, inclining to brown, with a short thick head, and erect rounded ears. In habits and appearance, they resemble the prairie dog, and are believed to be a species of the same genus. The mouth of their burrow is usually placed under the projection of a rock; and near these the party afterwards saw several of the little animals watching their approach, and uttering all the time a shrill note, somewhat like that of the ground squirrel. Several attempts were made to procure a specimen of this animal, but always without success, as we had no guns but such as carried a heavy ball.

After sitting about half an hour, we found ourselves somewhat refreshed, but much benumbed with cold. We now found it would be impossible to reach the summit of the mountain, and return to our camp of the preceding night, during that part of the day which remained; but as we could not persuade ourselves to turn back, after having so nearly accomplished the ascent, we resolved to take our chance of spending the night on whatever part of the mountain it might overtake us. Wilson had not yet been seen; but as no time could be lost, we resolved to go as soon as possible to the top of the peak, and look for him on our return. We met, as we proceeded, such numbers of unknown and interesting plants, as to occasion much delay in col-

lecting; and were under the mortifying necessity of passing by numbers we saw in situations difficult of access.

As we approached the summit, these became less frequent, and at length ceased entirely. Few cryptogamous plants are seen about any part of the mountain; and neither these nor any others occur frequently on the top of the peak. There is an area of ten or fifteen acres, forming the summit, which is nearly level; and on this part scarce a lichen was to be seen. It is covered to a great depth with large splintery fragments of a rock entirely similar to that found at the base of the peak, except perhaps a little more compact in its structure. By removing a few of these fragments, they were found to rest upon a bed of ice, which is of great thickness, and may, perhaps, be as permanent as the rocks with which it occurs.

It was about 4 o'clock P. M. when the party arrived on the summit. In our way we had attempted to cross a large field of snow, which occupied a deep ravine, extending down about half a mile from the top, on the south-eastern side of the peak. This was, however, found impassable, being covered with a thin ice, not sufficiently strong to bear the weight of a man. We had not been long on the summit when we were rejoined by the man who had separated from us, near the outskirts of the timber. He had turned aside and lain down to rest, and afterwards pursued his journey by a different route.

From the summit of the peak, the view towards the north-west and south-west is diversified with innumerable mountains, all white with snow; and on some of the more distant it appears to extend down to their bases. Immediately under our feet, on the west, lay the narrow valley of the Arkansa, which we could trace running towards the north-west, probably more than sixty miles.

On the north side of the peak was an immense

mass of snow and ice. The ravine in which it lay terminated in a woodless and apparently fertile valley, lying west of the first great ridge, and extending far towards the north. This valley must undoubtedly contain a considerable branch of the Platte. In a part of it, distant probably thirty miles, the smoke of a large fire was distinctly seen, supposed to indicate the encampment of a party of Indians. *

To the east lay the great plain, rising as it receded, until in the distant horizon it appeared to mingle with the sky. A little want of transparency in the atmosphere, added to the great elevation from which we saw the plain, prevented our distinguishing the small inequalities of the surface. The Arkansa, with several of its tributaries, and some of the branches of the Platte, could be distinctly traced as on a map, by the line of timber along their courses.

On the south the mountain is continued, having another summit, (supposed to be that ascended by Captain Pike,) at the distance of eight or ten miles. This, however, falls much below the high peak in point of elevation, being wooded quite to its top. Between the two lies a small lake, apparently a mile long, and half a mile wide, discharging eastward into the Boiling-spring creek. A few miles farther towards the south, the range containing these two peaks terminates abruptly.

The weather was calm and clear while the detachment remained on the peak; but we were surprised to observe the air in every direction filled with such clouds of grasshoppers, as partially to obscure the day. They had been seen in vast numbers about

* It is related in Du Pratz's History of Louisiana, p. 71., that in the year 1724, a large tribe of Indians, called Padoucas, resided in several villages on the heads of the Konzas river; that they removed thence to the sources of the Platte: here they are said still to exist. See Brackenridge's Views, p. 147. Lewis and Clarke's Map, &c. But these accounts need confirmation.

all the higher parts of the mountain, and many had fallen upon the snow and perished. It is, perhaps, difficult to assign the cause which induces these insects to ascend to those highly elevated regions of the atmosphere. Possibly they may have undertaken migrations to some remote district; but there appears not the least uniformity in the direction of their movements. * They extended upwards from the summit of the mountain to the utmost limit of vision; and as the sun shone brightly, they could be seen by the glittering of their wings, at a very considerable distance.

About all the woodless parts of the mountain, and particularly on the summit, numerous tracks were seen, resembling those of the common deer, but most probably have been those of the animal called the big horn. The skulls and horns of these animals we had repeatedly seen near the licks and saline springs at the foot of the mountain, but they are known to resort principally about the most elevated and inaccessible places.

The party remained on the summit only about half an hour; in this time the mercury fell to 42°, the thermometer hanging against the side of a rock, which in all the early part of the day had been exposed to the direct rays of the sun. At the encampment of the main body in the plains, a corresponding thermometer stood in the middle of the day at 96°, and did not fall below 80° until a late hour in the evening.

Great uniformity was observed in the character of the rock about all the upper part of the mountain.

* Notes referring particularly to this grasshopper, and to many other insects, and many other animals, collected on the Platte and about the mountains, were subsequently lost in the robbery committed by three of the soldiers, who deserted from the party in the country of the Osages. It is on this account that the name of the insect alluded to cannot be given, as it is now impossible to identify the specimen.

It is a compact, indestructible aggregate of quartz and felspar, with a little hornblende, in very small particles. Its fracture is fine, granular, or even; and the rock exhibits a tendency to divide when broken into long, somewhat splintery fragments. It is of a yellowish brown colour, which does not perceptibly change by long exposure to the air. It is undoubtedly owing to the close texture and the impenetrable firmness of this rock that so few lichens are found upon it. For the same reason it is little subject to disintegration by the action of frost. It is not improbable that the splintery fragments, which occur in such quantities on all the higher parts of the peak, may owe their present form to the agency of lightning. No other cause seems adequate to the production of so great an effect.

Near the summit some large detached crystals of felspar, of a pea-green colour, were collected; also large fragments of transparent, white and smoky quartz, and an aggregate of opaque white quartz, with crystals of hornblende.

At about five in the afternoon the party began to descend, and a little before sunset arrived at the commencement of the timber; but before we reached the small stream at the bottom of the first descent, we perceived we had missed our way. It was now become so dark as to render an attempt to proceed extremely hazardous; and as the only alternative, we kindled a fire, and laid ourselves down upon the first spot of level ground we could find. We had neither provisions nor blankets; and our clothing was by no means suitable for passing the night in so bleak and inhospitable a situation. We could not, however, proceed without imminent danger from precipices; and by the aid of a good fire, and no ordinary degree of fatigue, found ourselves able to sleep during a greater part of the night.

15th. At day break on the following morning, the thermometer stood at 38°. As we had few comforts to leave, we quitted our camp as soon as

the light was sufficient to enable us to proceed. We had travelled about three hours when we discovered a dense column of smoke rising from a deep ravine on the left hand. As we concluded this could be no other than the smoke of the encampment where we had left our blankets and provisions, we descended directly towards it. The fire had spread and burnt extensively among the leaves, dry grass, and small timber, and was now raging over an extent of several acres. This created some apprehension, lest the smoke might attract the notice of any Indians who should be at that time in the neighbourhood, and who might be tempted by the weakness of the party to offer some molestation. But we soon discovered a less equivocal cause of regret in the loss of our *cache* of provisions, blankets, clothing, &c. which had not escaped the conflagration. Most of our baggage was destroyed; but out of the ruins we collected a beggarly breakfast, which we ate, notwithstanding its meanness, with sufficient appetite. We chose a different route for the remaining part of the descent from the one taken in going up, and by that means avoided a part of the difficulty arising from the crumbled granite; but this was nearly compensated by the increased numbers of yuccas and prickly pears.

We arrived a little after noon at the boiling spring, where we indulged freely in the use of its highly aërated and exhilarating waters. In the bottom of both these springs a great number of beads and other small articles of Indian ornament were found, having unquestionably been left there as sacrifices or presents to the springs, which are regarded with a sort of veneration by the savages. Bijeau assured us he had repeatedly taken beads and other ornaments from these springs, and sold them to the same savages who had thrown them in.

A large and much frequented road passes the springs, and enters the mountains, running to the north of the high peak. It is travelled principally

by the bisons, sometimes also by the Indians; who penetrate here to the Columbia.

The men who had been left at the horse-camp about a mile below the springs, had killed several deer, and had a plentiful supply of provisions. Here the detachment dined; then mounting our horses, we proceeded towards the encampment of the main body, where we arrived a little after dark, having completed our excursion within the time prescribed.

Among the plants collected in this excursion, several appear to be undescribed. Many of them are strictly alpine, being confined to the higher parts of the mountain, above the commencement of snow.

Most of the timber which occurs on any part of the mountain is evergreen, consisting of several species of abies, among which may be enumerated the balsam fir (A. balsamea, Ph.); the hemlock, white, red, and black spruce (A. canadensis, A. alba, A. rubra, and A. nigra); the red cedar, and common juniper; and a few pines. One of these, which appears to have been hitherto unnoticed in North America, has, like the great white or Weymouth pine, five leaves in a fascicle; but in other respects there is little resemblance between them. The leaves are short and rather rigid; the sheaths which surround their bases short and lacerated; the strobiles erect, composed of large unarmed scales, being somewhat smaller than those of P. rigida, but similar in shape, and exuding a great quantity of resin. The branches, which are covered with leaves chiefly at the ends, are numerous and recurved, inclining to form a dense and large top; they are also remarkably flexile, feeling in the hand somewhat like those of the dirca palustris, L. From this circumstance, the specific name, flexilis, has been proposed for this tree; which is, in several respects, remarkably contrasted with the P. rigida. It inhabits the arid plains subjacent to the Rocky Mountains, and extends up their sides to the region of perpetual frost. The

fruit of the pinus flexilis is eaten by the Indians and the French hunters, as that of another species of the same genus is eaten by the inhabitants of some parts of Europe.

The creek on which the party encamped during the three days occupied in making the excursion above detailed, is called Boiling-spring creek, having one of its principal sources in the beautiful spring already described. It is skirted with a narrow margin of cotton-wood and willow trees; and its banks produce a small growth of rushes, on which our horses subsisted principally, while we lay encamped here. This plant, the common rush (equisetum hyemale, Ph.), found in every part of the United States, is eaten with avidity by horses, and is often met with in districts where little grass is to be had. When continued for a considerable time its use proves deleterious.

The recent track of a grizzly bear was observed near the camp; and at no great distance one of those animals was seen and shot at by one of the hunters, but not killed.

In the timber along the creek, the sparrow-hawk, mocking-bird, robin, red-head woodpecker, Lewis' woodpecker, dove, winter wren, towhe, bunting, yellow-breasted chat, and several other birds were seen.

Orbicular lizards were found about this camp, and had been once or twice before noticed near the base of the mountains.

A smoke, supposed to be that of an Indian encampment, was seen rising from a part of the mountains, at a great distance towards the north-west. It had been our constant practice, since we left the Missouri, to have sentinels stationed about all our encampments, and whenever we were not on the march by day, and until nine o'clock in the evening; it was the duty of one of the three Frenchmen to reconnoitre at a distance from camp, in every direction, and to report immediately when any thing

should be discovered indicating that Indians were in the vicinity. Precautions of this kind are necessary to prevent surprisal, and invariably are practised by the Indians of the west, both at their villages and on their march.

On the 14th, Lieutenant Swift returned to camp, having performed the duties on which he was sent. A base was measured near the camp, and observations taken for ascertaining the elevation of the peak.

Complete sets of observations for latitude and longitude were taken, which gave 38° 18′ 19″ north, and 105° 39′ 44″ west from Greenwich, or 28° 39′ 45″ from Washington, as the position of our camp. The bearing of the Peak from this point is north 67° west, and the distance about twenty-five miles.

In all the prairie-dog villages we had passed small owls had been observed moving briskly about, but they had hitherto eluded all our attempts to take them. One was here caught, and on examination, found to be the species denominated coquimbo, or burrowing owl, (strix cunicularia.) This fellow-citizen of the prairie-dog, unlike its grave and recluse congeners, is of a social disposition, and does not retire from the light of the sun, but endures the strongest mid-day glare of that luminary, and is in all respects a diurnal bird. It stands high upon its legs, and flies with the rapidity of the hawk. The coquimbo owl, both in Chili and St. Domingo, agreeably to the accounts of Molina and Viellot, digs large burrows for its habitations, and for the purposes of incubation; the former author gives us to understand that the burrow penetrates the earth to a considerable depth, whilst Viellot informs us that in St. Domingo, the depth is about two feet.

With us the owl never occurred but in the prairie-dog villages, sometimes in a small flock much scattered, and often perched on different hillocks, at a distance deceiving the eye with the appearance of

the prairie-dog, itself, in an erect posture. They are not shy, but readily admit the hunter within gun-shot; but on his too near approach, a part or the whole of them rise upon the wing, uttering a note very like that of the prairie-dogs, and alight at a short distance, or continue their flight beyond the view.

The burrows into which we have seen the owl descend, resembled in all respects those of the prairie-dog, leading us to suppose, either that they were common, though, perhaps not friendly occupants of the same burrow, or that the owl was the exclusive tenant of a burrow gained by right of conquest. But it is at the same time possible, that, as in Chili, the owl may excavate his own tenement.

From the remarkable coincidence of note between these two widely distinct animals, we might take occasion to remark the probability of the prairie-dog being an unintentional tutor to the young owl, did we not know that this bird utters the same sounds in the West Indies, where the prairie-dog is not known to exist.

It may be that more than a single species of diurnal owl has been confounded under the name of *cunicularia*, as Viellot states his bird to be somewhat different from that of Molina; and we cannot but observe that the eggs of the bird described by the latter are spotted with yellow, whilst those of the former are immaculate.

As our specimens do not in all respects correspond with the descriptions by the above-mentioned authors, of the Coquimbo owl, we have thought proper to subjoin such particulars as seem necessary to be noted, in addition to the description already given by those authors.

The general colour is a light burnt brown spotted with white; the larger feathers five or six-banded with white, each band more or less widely interrupted by the shaft, and their immediate margins darker than the other portions of the feathers; the

tips of these feathers are white or whitish; the exterior primary feather is serrated, shorter than the three succeeding ones, and equal in length to the fifth; the bill is tinged with yellow on the ridges of both mandibles; the tarsi and feet distinctly granulated, the former naked behind, furnished before, near the base, with dense, short feathers, which, towards the toes, become less crowded, and assume the form of single hairs; those on the toes are absolutely setaceous and scattered; the lobes beneath the toes are large and granulated.

On the plains about our encampment, were numerous natural mounds, greatly resembling some of the artificial works so common in the central portions of the great valley of the Mississipi. About the summits of these mounds, were numerous petrifactions, which were found to be almost exclusively casts of bivalve shells approaching the genus cytherea, and usually from one half to one and an half inches in width.

On the evening of the fifteenth, finding all our stock of meat injured by too long keeping, four men were sent out on horseback to hunt. At the distance of six miles from camp, they found a solitary bison, which they killed, but concluding from its extreme leanness and the ill-savour of the flesh, that the animal was diseased, they took no part of it. On the following morning they returned, bringing nothing. We were now reduced to the necessity of feeding on our scanty allowance of a gill of parched maize per day to each man, this being the utmost that our limited stores would afford.

On the 16th of July, we moved from our encampment on Boiling-spring creek, in a south-western direction to the Arkansa. This ride of twenty-eight miles, which we finished without having once dismounted from our horses, occupied about twelve hours of a calm, sultry day, in every respect like the preceding, in which the thermometer in the shade had

ranged from 90 to 100°. Our route lay across a tract of low but somewhat broken sandstone, of an uncommonly slaty structure. It is fine-grained, with an argillaceous cement, and of a light gray or yellowish white colour. It contains thin beds of bituminous clay-slate; and we saw scattered on the surface some small crystals of selenite. It is traversed by numerous deep ravines, in which at this time, not a drop of water was to be found. The soil is scanty, and of incurable barrenness. The texture of the rock is so loose and porous as to unfit it for retaining any portion of the water which falls upon it in rains. A few dwarfish cedars and pines are scattered over a surface consisting of a loose dusty soil, intermixed with thin lamellar fragments of sandstone, and nearly destitute of grass or herbage of any kind. Our sufferings from thirst, heat, and fatigue, were excessive, and were aggravated by the almost unlimited extent of the prospect before us, which promised nothing but a continuation of the same dreary and disgusting scenery. Late in the afternoon we arrived at the brink of the precipice which divides the high plains from the valley of the Arkansa; this is here narrow, and so deeply sunk in the horizontal sandstone, that although there are trees of considerable size growing along the river, they do not rise to the level of the surface of the great plain, and from a little distance on either side, the valley is entirely hid. There our thirst and impatience were for some time tantalized with the view of the cool and verdant valley and copious stream of the Arkansa, while we were searching up and down for a place where we could descend the precipice.

We at length found a rugged ravine, down which we with some difficulty wound our way to the base of the cliff, where lay a beautiful level plain, having some scattered cotton-wood and willow trees, and afforded good pasture for our horses. Here we encamped, and the remainder of the afternoon was

spent in making preparations to despatch a small party up the Arkansa to the mountains on the succeding day.

A small doe was killed near camp, which, though extremely lean, proved an important addition to our supply of provisions.

The place where we encamped was supposed to have been near where Pike's block-house formerly stood, but we sought in vain for the traces of any thing resembling the work of a white man.

CHAPTER IX.

A DETACHMENT FROM THE EXPLORING PARTY ASCEND THE ARKANSA TO THE MOUNTAINS. — BELL'S SPRINGS. — DESCENT OF THE ARKANSA. — GRIZZLY BEAR.

On the morning of the 17th Captain Bell, with Dr. James and two men, took their departure, proposing to ascend the Arkansa to the mountains. They were furnished with provisions for two days, according to the scanty allowance to which we were all reduced. The river valley was found so narrow, and so obstructed by the timber and the windings of the stream, as greatly to obstruct the travelling; we therefore resolved to leave it, and pursue our journey in the open plain at a distance from the river. The course of the Arkansa, for the first twenty miles from the mountains, is but little south of east. It enters the plain at the extremity of an extensive amphitheatre, formed by the continued chain of the mountains on the west and north-west, and by the projecting spur which contains the high peak on the east. This semicircular area is about thirty miles in length from north to south, and probably twenty wide at its southern extremity. The mountains which bound it on the west are high, but at this time had little snow on them. The surface of the area is an almost unvaried plain, and is based upon the stratum of argillaceous sandstone. Near the base of the mountain the same sandstone is observed, resting in an inclined position against the primitive rocks. It forms a range like that already mentioned, when speaking of the mountains at the Platte, separated from the primitive by a narrow secluded valley. On entering this valley we found

the recent trace of a large party of Indians, travelling with skin lodges, who appeared to have passed within a very short time. This trace we followed, until we found it entered the mountains in the valley of a small stream which descends to the Arkansa from the north-east. This we left on the east, and traversing a rough and broken tract of sandstone hills, arrived, after a toilsome day's journey of about thirty miles, at the spot where the Arkansa leaves the mountains.

Here we found several springs, whose water is impregnated with muriate of soda and other salts. They rise near each other, in a small marshy tract of ground, occupying the narrow valley of the river, at the point where it traverses the inclined sandstone ridge. Very little water flows from them, and the evaporation of this has left a crystalline incrustation, whitening the surface of the surrounding marsh. The springs are small excavations, which may perhaps have been dug by the Indians or by white hunters. They appear to remain constantly full; they all contain muriate of soda, and the smell of sulphuretted hydrogen is perceptible at considerable distance from them. They differ in taste a little from each other, hence the account given of them by the hunters, that one is sour, another sweet, a third bitter, and so on. One contains so much fixed air as to give it some pungency, but the water of all of them is unpalatable. The sweetish metallic taste observed in the water of one or two, appears to depend on an impregnation of sulphate of iron.

The sulphates of magnesia and soda will probably be found to exist in these springs; if their water should hereafter be analysed, they may also be found to possess some active medicinal properties. They are seven in number, and have received the name of Bell's Springs, in compliment to their discoverer. Though the country around them abounds with bisons, deer, &c. they do not appear to be frequented,

as most saline springs are, by these or other herbivorous animals.

It was near sunset when Captain Bell and his party arrived at the springs, and being much exhausted by their laborious march, they immediately laid themselves down to rest under the open canopy, deferring their examinations for the following morning.

The sandstone near the springs is hard, though rather coarse, and of a dark gray or brownish yellow colour. In ascending the Arkansa on the ensuing morning, we found the rock to become more inclined, and of a redder colour, as we approached the primitive, until, at about half a mile from the springs, it is succeeded by the almost perpendicular gneiss rock, which appears here at the base of the first range of the mountains. We have noticed that this particular spot is designated, in the language of hunters, as "the place where the Arkansa *comes out* of the mountains;" and it must be acknowledged, the expression is not entirely inapplicable. The river pours with great impetuosity and violence through a deep and narrow fissure in the gneiss rock, which rises so abruptly on both sides to such a height, as to oppose an impassable barrier to all further progress. According to the delineation of Pike's route, upon the map which accompanies his work, he must have entered the mountains at this place; but no corroboration can be derived from his journal. It appears almost incredible that he should have passed by this route, and have neglected to mention the extreme difficulty which must have attended the undertaking. The detached party returned to the encampment of the main body on the 18th.

The immediate valley of the Arkansa, near the mountains, is bounded by high cliffs of inclined sandstone. At a short distance below these disappear, and a sloping margin of alluvial earth extends on each side to the distance of several miles. Somewhat farther down horizontal sandstone appears, con-

fining the valley to a very narrow space, and bounding it within perpendicular precipices on each side. Seven miles from the mountains, on the left hand side of the Arkansa, is a remarkable mass of sandstone rocks, resembling a large pile of architectural ruins.

From this point the bearing of James's Peak [26] was found to be due north.

The Arkansa valley, between our encampment of the 16th and the mountains, a distance of about thirty miles, has a meagre and gravelly soil, sustaining a growth of small cotton-wood trees, rushes, and coarse grass: above the rocky bluffs, on each side, spreads a dreary expanse of almost naked sand, intermixed with clay enough to prevent its drifting with the wind, but not enough to give it fertility. It is arid and sterile, bearing only a few dwarfish cedars, and must for ever remain desolate.

During the time of Captain Bell's absence on the excursion above detailed, observations were made at camp for latitude, longitude, &c., and all the party were busy in their appropriate pursuits. Among the animals taken here was the four-lined squirrel, (S. 4-vittatus, Say) a very small and very handsome species, very similar in its dorsal markings to the getulus, L.; but as far as we can judge from the description and figures of the latter species by Buffon, our animal is distinguished by its striped head, less rounded ears, and much less bushy, and not striated and banded tail, and by its smaller size. The getulus is also said to have no thumb wart.

It is an inhabitant of the Rocky Mountains about the sources of the Arkansa and Platte. It does not seem to ascend trees by choice, but nestles in holes and on edges of the rocks. We did not observe it to have cheek-pouches.

Its nest is composed of a most extraordinary quantity of the burrs of the xanthium branches, and other portions of the large upright cactus, small

branches of pine-trees and other vegetable productions, sufficient in some instances to fill the body of an ordinary cart. What the object of so great, and apparently so superfluous an assemblage of rubbish may be, we are at a loss to conjecture; we do not know what peculiarly dangerous enemy it may be intended to exclude by so much labour.

Their principal food, at least at this season, is the seeds of the pine, which they readily extract from the cones. [27]

There is also another species [28] inhabiting about the mountains, where it was first observed by those distinguished travellers, Lewis and Clarke, on their expedition to the Pacific Ocean. It is allied to the Sc. striatus, and belongs to the same subgenus (tamias illig.) but it is of a somewhat larger stature, entirely destitute of the vertebral line, and is further distinguished by the lateral lines commencing before the humerus, where they are broadest by the longer nails of the anterior feet, and by the armature of the thumb tubercle. It certainly cannot with propriety be regarded as a variety of the striatus, and we are not aware that the latter species is subject to vary to any remarkable degree in this country. But the species to which, in the distribution of its colours, it is most closely allied, is unquestionably the Sc. bilineatus of Geoffroy. A specimen is preserved in the Philadelphia Museum.

The cliff swallow [29] is here very frequent, as well as in all the rocky country near the mountains. This species attaches its nest in great numbers to the rocks in dry situations, under projecting ledges. The nest is composed of mud, and is hemispherical, with the entrance near the top somewhat resembling a chymist's retort, flattened on one side, and with the neck broken off for the entrance. This entrance, which is perfectly rounded sometimes, projects a little and turns downward. It is an active bird, flying about the vicinity of the nest in every direction,

like the barn swallow. In many of the nests we found young hatched, and in others only eggs.

A fine species of serpent [30] was brought into camp by one of the men. It is new, and seems to be peculiar to this region.

A very beautiful species of emberiza [31] was caught; it is rather smaller than the indigo bunting, (emberiza cyanea) with a note entirely dissimilar. It was observed to be much in the grass, rarely alighting on bushes or trees.

We also captured a rattle-snake, [32] which, like the tergeminus, we have found to inhabit a barren soil, and to frequent the villages of the arctomys of the prairie; but its range appeared to us confined chiefly to the vicinity of the Rocky Mountains. Its rattle is proportionally much larger than that of the species just mentioned, and the head is destitute of large plates. It seems, by the number of plates and scales, to be allied to the atracaudatus of Bosc. and Daud., but their description induces the conclusion that their species is entirely white beneath. It is also allied to the crotalus durissus, L. (C. rhombifer, Beaur.), but it is smaller, and the dorsal spots are more rounded. A specimen is placed in the Philadelphia Museum.

The only specimens of organic reliquiæ from this vicinity, which we have been so fortunate as to preserve, are very indistinct in their characters, and are only impressions in the gray sandstone. One of them appears to have been a phytoid millepore, and the other a sub-equilateral bivalve, which may possibly have been a mactra. It is suborbicular, and its surface is marked by concentric grooves or undulations. At a previous encampment numerous fragments of shells, of a dusky colour, occurred in the same variety of sandstone, and amongst these is an entire valve of a small species of ostrea, of a shape very like that of a pinna, and less than half an inch in length. We have a specimen, from another

locality, of a very dark coloured compact, and very fœtid impure limestone, containing still more blackish fragments of bivalves, one of which presents the form of a much arcuated mytillus? but as the back of the valve only is offered to examination, it may be a chama, but it seems to be perfectly destitute of sculpture.

Another specimen from the mountains near the Platte river, is a reddish brick-coloured petrosiliceous mass, containing casts and impressions of a grooved terebratula.

Hunters were kept out during the day on the 17th, but killed nothing. At evening they were sent out on horseback, but did not return till 3 P. M. on the following day. They had descended the river twelve miles, finding little game. They had killed one deer, one old turkey with her young brood of six. This supply proved highly acceptable as we had for some time been confined almost entirely to our small daily allowance of corn-meal. At the commencement of our tour we had taken a small supply of sea-biscuit. At first these were distributed one to each man three times per day, afterwards two, then one for two, and then one for three days, till our stock of bread was so nearly exhausted, that it was thought proper to reserve the little that remained for the use of the sick, should any unfortunately require it. We then began upon our parched maize, which proved an excellent substitute for bread. This was issued at first at the rate of one pint per day for four men, no distinction being made in this or any other case between the officers and gentlemen of the party, and the citizens and soldiers attached to it. When we arrived at the Arkansa, about one-third part of our supply of this article was exhausted, and no augmentation of the daily issues could be allowed, although our supplies of meat had been for some time inadequate to the consumption of the party.

We had a little coffee, tea, and sugar, but these were reserved as hospital stores; our three gallons of salt were expended. We now depended entirely upon hunting for our subsistence, as we had done for meat ever since we left the Pawnee villages, our pork having been entirely consumed before we arrived at that place. We, however, apprehended little want of meat after we should have left the mountains, as we believed there would be plenty of bisons and other game upon the plains over which we were to travel.

At 2 o'clock P. M. on the eighteenth, rain began to fall which continued during the remainder of the day, and made it impossible for us to complete the observations we had begun.

The Arkansa, from the mountains to the place of of our encampment, has an average breadth of about sixty yards, it is from three to five feet deep, and the current rapid. At the mountains, the water was transparent and pure, but soon after entering the plains it becomes turbid and brackish.

July 19th. This morning we turned our backs upon the mountains, and began to move down the Arkansa. It was not without a feeling of something like regret, that we found our long contemplated visit to these grand and interesting objects, was now at an end. One thousand miles of dreary and monotonous plain lay between us, and the enjoyments and indulgences of civilized countries. This we were to traverse in the heat of summer, but the scarcity of game about the mountains rendered our immediate departure necessary.

A large and beautiful animal [33] of the lizard kind (belonging to the genus ameiva) was noticed in this day's ride. It very much resembles the lacerta ameiva, as figured and described by Lacepede, but the tail is proportionably much longer. Its movements were so extremely rapid that it was with much difficulty we were able to capture a few of them.

We had proceeded about eight or ten miles from our camp, when we observed a very considerable change in the character both of the river and its valley, the former becoming wider, less rapid, and filled with numerous islands; the latter bounded by sloping sand-hills, instead of perpendicular precipices. Here the barren cedar-ridges, formerly mentioned, are succeeded by still more desolate plains, with scarce a green or a living thing upon them, except here and there a tuft of grass, an orbicular lizard, basking on the scorching sand, a solitary pimelia, a blaps, or a galeodes. Among the few stinted and withered grapes, we distinguished a small cespitose species of agrestis, and several others which are thought to be undescribed. Near the river, and in spots of uncommon fertility, the unicorn plant, (martynia proboscidea, Ph.) was growing in considerable perfection. This plant, which is sometimes cultivated in the gardens, where it is known by the name of cuckold's horns, is a native of the Platte and Arkansa, and is occasionly seen in every part of the open country from St. Louis westward to the mountains.

A little before noon, we crossed a small stream which was called Castle Rock creek, from a remarkable pile of naked rocks, and halted for dinner on the bank of the river.

In the morning, Mr. Peale and two hunters had taken a different route from the remainder of the party, hoping to meet with game. They arrived at a small grove of timber, where it was thought deer might be found; they therefore left their horses in care of one of the hunters, and entered the wood on foot. The man had been left alone but a short time, when he discovered a large grizzly bear (ursus horribilis, Ord.) approaching rapidly towards him, and without staying to make any inquiry into the intentions of the animal, mounted his horse and fled.

This animal is widely distinct from any known

species of bear, by the essential character of the elongated anterior claws, and rectilinear or slightly arcuated figure of its facial profile. In general appearance it may be compared to the alpine bear, (U. arctus), and particularly to the Norwegian variety. The claws, however, of these appear to be of the usual form and not elongated, and the facial space included between the eyes is deeply indented; they also differ in their manners, and climb trees, which the grizzly bear is never known to do.

Lewis and Clarke frequently saw and killed these bears during their celebrated expedition across the continent. They mention one which was nine feet long from the nose to the tip of the tail. The fore foot of another was nine inches across, its hind foot eleven and three quarter inches long, exclusive of the talons, and seven inches wide. The talons of a third were six and one-fourth inches long.

They will not always attack, even when wounded. "As they fired, he did not attempt to attack, but fled with a most tremendous roar, and such was its extraordinary tenacity of life, that although he had five balls passed through his lungs, and five other wounds, he swam more than half across the river to a sand-bar, and survived twenty minutes. He weighed between five or six hundred pounds, at least, and measured eight feet seven and a half inches from the nose to the extremity of the hind feet." — *Lewis and Clarke.*

One lived two hours after having been shot through the centre of his lungs, and whilst in this state, he prepared for himself a bed in the earth two feet deep and five feet long, after running a mile and a half. The fleece and skin were a heavy burden for two men, and the oil amounted to eight gallons.

Another shot through the heart, ran at his usual pace nearly a quarter of a mile, before he fell.

This species, they further inform us, in all its varia-

ations of colouring, is called hohhost by the Chopunnish Indians. These travellers mention another species of bear, which seems to be related to the alpine bear, and which is most probably a new species. It climbs trees, and is known to the Chopunnish Indians by the name of Yackak. They also inform us, that the copulating season occurs about the 15th of June.

The Indians of the Missouri sometimes go to war in small parties against the grizzly bear, and trophies obtained from his body are highly esteemed, and dignify the fortunate individual who obtains them. We saw, on the necks of many of their warriors, necklaces, composed of the long fore-claws separated from the foot, tastefully arranged in a radiating manner; and one of the band of Pawnee warriors, that encountered a detachment of our party near the Kanza village, was ornamented with the entire skin of the fore-foot, with the claws remaining upon it, suspended on his breast.

It is not a little remarkable that the grizzly bear, which was mentioned at a very early period, by Lahontan, and subsequently by several writers, is not, even at this day, established in the zoological works as distinct species; that it is perfectly distinct from any described species, our description will prove. From the concurrent testimony of those who have seen the animal in its native country, and who have had an opportunity of observing its manners, it is, without doubt, the most daring and truly formidable animal that exists in the United States. He frequently pursues and attacks hunters; and no animal, whose swiftness or art is not superior to his own, can evade him. He kills the bison, and drags the ponderous carcass to a distance to devour at his leisure, as the calls of hunger may influence him.

The grizzly bear is not exclusively carnivorous, as has by some persons been imagined; but also, and perhaps in a still greater degree, derives nourishment

from vegetables, both fruits and roots; the latter he digs up by means of his long fore-claws.

That they formerly inhabited the Atlantic states, and that they were then equally formidable to the Indians, we have some foundation for belief in the tradition of the Delaware Indians, respecting the big naked bear; the last one of which they believe formerly existed east of the Hudson river, and which Mr. Heckewelder assures us, is often arraigned by the Indians before the minds of their crying children, to frighten them to quietness.

Governor Clinton, in the notes appended to his learned *Introductory Discourse* *, says, "Dixon, the Indian trader, told a friend of mine, that this animal had been seen fourteen feet long; that notwithstanding its ferocity, it has been sometimes domesticated; and that an Indian belonging to a tribe on the head waters of the Mississippi, had one in a reclaimed state, which he sportively directed to go into a canoe belonging to another tribe of Indians then about returning from a visit. The bear obeyed, and was struck by an Indian; being considered one of the family, this was deemed an insult, was resented accordingly, and produced a war between these nations."

A half-grown specimen was kept chained in the yard of the Missouri fur-company, near Engineer Cantonment; last winter he was fed chiefly on vegetable food, as it was observed that he became furious when too plentifully supplied with animal fare. He was in continual motion during the greater part of the day, pacing backwards and forwards to the extent of his chain. His attendants ventured to play with him, though always in a reserved manner, fearful of trusting him too far or placing themselves absolutely within his grasp. He several times broke loose from his chain; on which occasions he would manifest

* Vid. Trans. of the New York Literary and Philosophical Society.

the utmost joy, running about the yard in every direction, rearing up on his hind-feet, and capering about. I was present at one of these exhibitions; the squaws and children belonging to the establishment ran precipitately to their huts, and closed the doors. He appeared much delighted with his temporary freedom; he ran to the dogs who were straying about the yard, but they avoided him. In his round he came to me; and rearing up, placed his paws on my breast. Wishing to rid myself of so rough a playfellow, I turned him around; upon which he ran down the bank of the river, plunged into the water, and swam about for some time.

Mr. J. Dougherty has had several narrow escapes from the grizzly bear. He was once hunting with a companion on one of the upper tributaries to the Missouri: he heard the report of his companion's rifle; and looking round, beheld him at a little distance, endeavouring to escape from one of these bears, which he had wounded as it was advancing on him. Mr. D., attentive only to the preservation of his friend, immediately hastened to divert the attention and pursuit of the bear to himself, and arrived within rifle-shot distance just in time to effect his generous object. He lodged his ball in the animal, and was obliged to fly in his turn; whilst his friend, relieved from imminent danger, prepared for another onset, by charging his piece, with which he again wounded the bear, and relieved Mr. D. from pursuit. In this most hazardous encounter neither of them were injured, and the bear was fortunately destroyed.

Several hunters were pursued by a grizzly bear that gained rapidly upon them. A boy belonging to the party, who possessed less speed than his companions, seeing the bear at his heels, fell with his face to the soil; the bear reared up on his hind-feet over the boy, looked down for a moment upon him, then bounded over him in pursuit of the fugitives.

A hunter, just returned from a solitary excursion

to the river, informed me at Engineer cantonment, that going one morning to examine his traps, he was pursued by a bear, and had merely time to get into a small tree, when the bear passed beneath him; and without halting, or even looking up, passed on at the same pace.

Another hunter received a blow from the fore-paw of one of these animals, which carried away his eye and cheek-bone.

In proof of the great muscular power with which this animal is endowed, a circumstance related to us by Mr. J. Dougherty may be stated. He shot down a bison; and leaving the carcass to obtain assistance to butcher it, he was surprised on his return to find that it had been dragged entire, to a considerable distance, by one of these bears, and was now lodged in a concavity of the earth, which the animal had scooped out for its reception.

Notwithstanding the formidable character of this bear, we have not made use of any precautions against their attacks; and although they have been several times prowling about us in the night, they have not evinced any disposition to attack us at that season.

They appear to be more readily intimidated by the voice, than by the appearance of men.

The grizzly bears, represented on the annexed plate, were brought, when very young, from the country of the Sioux by Lieutenant Pike, and were presented to the Philadelphia Museum. They were kept several years in that splendid institution, secured in a strong cage; during which time they gradually increased in size, until at length they became dangerous from their strength and unsubdued ferocity, and it was judged proper to prepare them for the cabinet. From these specimens our description is chiefly taken. [34]

CHAPTER X.

NATURAL MOUNDS. — KASKAIA INDIAN AND SQUAW. — PREPARATIONS FOR A DIVISION OF THE PARTY. — SANDSTONES OF THE HIGH PLAINS SOUTH OF THE ARKANZA. — FLETZ TRAP FORMATION.

In the afternoon of the 19th of July we passed the mouth of the river St. Charles, called by Pike the Third Fork, which enters the Arkansa from the south-west. It is about twenty yards wide; and receives, eight miles above its confluence, the Green Horn creek, a small stream from the south-west. The Green Horn rises in the mountains, and passes between the Spanish peaks into the plains. These two peaks had been for several days visible, standing close to each other, and appearing entirely insulated. If they are not completely so, the other parts of the same range fall far below them in point of elevation. They are of a sharp conic form, and their summits are white with snow at midsummer.

This day we travelled twenty-five miles, the general direction of our course being a little south of east, and encamped at five P.M. in a grassy point on the north side of the river. The soil of the islands and the immediate valley of the river were found somewhat more fertile than above. Immediately after encamping, the hunters were sent out, who soon returned with two deers and a turkey.

In the evening the altitude of Antares was taken. Throughout the night we were much annoyed by mosquitos, the first we had met for some weeks in sufficient numbers to be troublesome.

July 20th. We left our encampment on the following morning at five, the weather warm and fair.

Soon afterwards we passed the mouth of a creek on the south side, which our guide informed us is called by the Spaniards Wharf creek, probably from the circumstance of its washing the base of numerous perpendicular precipices of moderate height, which is said to be the case. It is the stream designated in Pike's map as the Second Fork. A party of hunters in the employ of Choteau, who were taken prisoners by the Spaniards in the month of May, 1817, were conducted up this creek to the mountains, thence across the mountains to Santa Fé.

We observed this morning some traces of Indians, but none very recent. On the preceding day we had passed the site of a large encampment, where we saw several horse-pens well fenced.

Near the place where we halted to dine, a large herd of elk was seen; but unfortunately they "took the wind of us," and disappeared, giving us no opportunity to fire upon them.

Along the river bluffs we saw numerous conic mounds, resembling those of artificial formation so frequently met with near the Ohio and Mississippi rivers, but differing from them by their surface from the apex to the base being terminated by a strait or concave instead of a convex curve, which is usual in those of artificial origin. The natural mounds of which we speak appear usually to contain a nucleus of sandstone, which is sometimes laid bare at the summit or on the sides, and sometimes entirely concealed by the accumulated *débris* resting upon it, but often contains petrified remains of marine animals.

At the end of this day's ride of twenty-six miles, we found the river valley more than a mile in width, and the distant hills or bluffs which bound it low, and of gradual ascent. The boulders, pebbles, and gravel so abundant near the base of the mountain, had been growing gradually less frequent and diminishing in size, till they had now almost entirely disappeared, their place being supplied by a fine

sand intermixed with clay, which here composed the surface. The soil is still marked with a character of extreme barrenness, the islands and the immediate margin of the river bearing an inconsiderable growth of cotton-wood and willows, but the great mass of the country being almost destitute of vegetation of any kind. Hunters were sent out immediately on encamping, and returned at dark, bringing a wild cat, an old turkey, and five of her chickens.

A bird was taken, closely resembling in point of colouring a species preserved in the Philadelphia Museum, under the name of *ruby-crowned flycatcher*, said to be from the East Indies; but the bill differs in being much less dilated. We can hardly think it a new species, yet in the more common books we do not find any distinct description of it. It is certainly allied to the tyrannus griseus and sulphuratus of Vieillot; but in addition to other differential characters, it is distinguished from the former by its yellow belly, and from the latter by the simplicity of the colouring of the wing and tail feathers, and the absence of bands on the side of the head; the bill also is differently formed from that of either of those species, if we may judge from Vieillot's figures. [35].

Friday, July 21st. We left our encampment at five A.M., and having descended six or eight miles along the river, met an Indian and squaw, who were, as they informed us, of the tribe called Kaskaia; by the French, Bad-hearts. They were on horseback; and the squaw led a third horse of uncommon beauty. They were on their way from the Arkansa below to the mountains near the sources of the Platte, where their nation sometimes resides. They informed us that the greater part of six nations of Indians were encamped about nineteen days' journey below us, on the Arkansa. These were the Kaskaias, Shiennes, Arrapahoes, Kiawas, the Bald-heads, and a few Shoshones or Snakes. These nations, the Kas-

kaia informed us, had been for some time embodied, and had been engaged in a warlike expedition against the Spaniards. They had recently met a party of Spaniards on Red river, when a battle was fought, in which the Spaniards were defeated with considerable loss.

We now understood the reason of a fact which had appeared a little remarkable; namely, that we should have traversed so great an extent of Indian country as we had done since leaving the Pawnees, without meeting a single savage. The bands above enumerated are supposed to comprise nearly the whole erratic population of the country about the sources of the Platte and Arkansa; and they had all been absent from their usual haunts on a predatory excursion against the Indians of New Mexico.

At our request, the Kaskaia and his squaw returned with us several miles, to point out a place suitable for fording the Arkansa, and to give us any other information or assistance in their power to communicate. Being made to understand that it was the design of some of the party to visit the sources of Red river, he pretended to give us information and advice upon that subject; also to direct us to a place where we might find a mass of rock salt, which he described as existing on one of the upper branches of Red river.

At ten o'clock we arrived at the ford, where we halted to make a distribution of the baggage and other preparations requisite to the proposed division of the party. Our Kaskaia visitor, with his handsome and highly ornamented wife, encamped near us, erecting a little tent covered with skins. They presented us some jerked bison meat, and received in return some tobacco and other inconsiderable articles. A small looking-glass, which was among the presents given him, he immediately stripped off the frame and covering, and inserted it with some ingenuity into a large billet of wood, on which he

began to carve the figure of an alligator. Captain Bell bought of him the horse they had led with them; and which, according to their account, had recently been caught from among the wild horses of the prairie. This made some new arrangement of their baggage necessary; and we were surprised to witness the facility and despatch with which the squaw constructed a new pack-saddle. She felled a small cotton-wood tree, from which she cut two large forked sticks. These were soon reduced to the proper dimensions, and adapted to the ends of two flat pieces of wood about two feet in length, and designed to fit accurately to the back of the horse, a longitudinal space of a few inches in width being left between them to receive the ridge of the back. The whole was fastened together without nails, pins, or mortices, by a strong covering of dressed horse hide sewed on wet with fibres of deer's sinew.

The Indian informed us he was called "The Calf." He appeared excessively fond of his squaw; and their caresses and endearments they were at no pains to conceal. It was conjectured by our guide, and afterwards ascertained by those who descended the Arkansa, that they had married contrary to the laws and usages of their tribe, the woman being already the wife of another man, and run away for concealment.

The small point of land on which we encamped has a sandy soil, and is thinly covered with cotton-wood, intermixed with the aspen poplar (*P. tremula*, Mx.) and a few willows. The undergrowth is scattered and small, consisting principally of the amorpha fruticosa and a syngenecious shrub, probably a vernonia. Along the base of the mountains, and about this encampment, we had observed a small asclepias not easily distinguished from a verticillata, but rarely rising more than two or three inches from the ground. Here, we saw also the A. longifolia and A. viridifolia of Punsh. The scanty

catalogue of grassy and herbaceous plants found here comprises two sunflowers, (H. giganteus, N. and an undescribed species,) the great bartonica, the Mexican argemone, the cactus ferox, the andropogon furcatum, and A. ciliatum, cyperus uncinatus, elymus striatus, and a few others. Soon after arriving at this encampment, we commenced the separation of our baggage, horses, &c. preparatory to the division of the party. It was now proposed, pursuant to the plan already detailed, that one division of the party, consisting of Mr. Say, Mr. Seymour, Lieut. Swift, the three Frenchmen, Bijeau, Le Doux, and Julian, with five riflemen, the greater part of the pack-horses, the heavy baggage, and the two dogs, all under the direction of Captain Bell, should proceed directly down the Arkansa by the most direct route to Fort Smith, there to await the arrival of the other division; while Major Long, accompanied by Dr. James, Mr. Peale, and seven men, should cross the Arkansa, and travel southward in search of the sources of Red river.

While several of the party were engaged in making these preparations, hunters were sent out; who were so far successful, that they soon returned, bringing two deer, one antelope, and seven turkeys. The opportunity of an unoccupied moment was taken to collect from Bijeau an account of some part of the Rocky Mountains which we had not seen.

Joseph Bijeau, (or Bessonet, which is his hereditary name, the former having been derived from a second marriage of his mother,) had performed, in a very adequate and faithful manner, the services of guide and interpreter from the Pawnee villages to this place. He had formerly been resident in these western wilds, in the capacity of hunter and trapper, during the greater part of six years.

He had traversed the country lying between the north fork of the Platte and the Arkansa in almost every direction. His pursuits often led him within the

Rocky Mountains, where the beaver are particularly abundant. He appears possessed not only of considerable acuteness of observation, but of a degree of candour and veracity which gives credibility to his accounts and descriptions. To him we are indebted for the following account of the country situated within the mountains.

The region lying west of the first range of the Rocky Mountains, and between the sources of the Yellow Stone on the north, and Santa Fé on the south, is made up of ridges of mountains, spurs and valleys. The mountains are usually abrupt, often towering into inaccessible peaks covered with perpetual snows. The interior ranges and spurs are generally more elevated than the exterior; this conclusion is at least naturally drawn from the fact, that they are covered with snow to a greater extent below their summits. Although that point which we have denominated James's Peak has been represented as higher than any other part of the mountains within one hundred or one hundred and fifty miles, we are inclined to believe it falls much below several other peaks, and particularly that which was for many days observed by the party when ascending the Platte.

The valleys within the Rocky Mountains are, many of them, extensive, being from ten to twenty or thirty miles in width, and are traversed by many large and beautiful streams. In these valleys, which are destitute of timber, the soil is frequently fertile and covered with a rich growth of a white-flowered clover, upon which horses and other animals feed with avidity. They have an undulating surface, and are terminated on all sides by gentle slopes leading up to the base of the circumjacent mountains. Timber may be had on the declivities of the hills in sufficient quantity to subserve the purposes of settlement. The soil is deep, well watered, and adapted to cultivation.

The Indians who inhabit within the mountains are roving bands, having no permanent places of residence, and subsisting entirely upon the products of the chase. The people called Padoucas have been often represented as residing in the district now under consideration; but are not at this time to be found here, unless this name be synonymous with that of the Bald-heads, or some other of the six nations already enumerated.

On the morning of the 22d, one of two hunters who had been sent out on the preceding day, but had not returned, came into camp to give notice that a bison had been killed at the distance of eight miles on the other side of the river; men were accordingly despatched with pack-horses to bring in the meat. Astronomical observations were resumed; and all the party were busily employed in the discharge of their ordinary duties, or in preparations for the approaching separation.* A vocabulary of the Kaskaia language was filled up with words obtained from the Calf, who still remained with us.

The New York bat (vespertilio noveboracensis) which occurs here, does not vary in any degree from the general characters and appearance of individuals of the Atlantic States. The specimen we obtained is most unequivocally furnished with incisores in the superior jaw, which by Pennant were denied to exist in the species of this name. These teeth being small, and hardly rising to a level with a line of the intervening callosity, might be readily overlooked by a casual observer, who does not aid his vision by the use of the lens. In adducing this fact, it must not be understood that we affirm the existence of those teeth in individuals of this species generally; we only refer to the single specimen before us.

* The results of several sets of observations gave us the position of this encampment, 38° 12′ 22″ north latitude, and 103° 46′ 15″ west longitude from Greenwich, or 26° 46′ 15″ from Washington.

A small bat was shot this evening during the twilight, as it flew rapidly in various directions over the surface of the creek. It appears to be an immature specimen, as the molares are remarkably long and acute: the canines are very much incurved, and the right inferior one singularly bifid at tip, the divisions resembling short bristles. This species is beyond a doubt distinct from the Carolina bat, (V. Caroliniana, Geoff.) with which the ears are proportionably equally elongated, and, as in that bat, a little ventricose on the anterior edge, so as almost to extend over the eye; but the tragus is much longer, narrower, and more acute, resembling that of the V. emarginatus, Geoff. as well in form as in proportion to the length of the ear. We call it V. subulatus, Say; and it may be thus described, — ears longer than broad, nearly as long as the head; hairy on the basal half; a little ventricose on the anterior edge, and extending near to the eye; tragus elongated, subulate; the hair above blackish at base, tip dull cinerious; the interfemoral membrane hairy at base; the hairs unicoloured, and a few also scattered over its surface and along its edge, as well as that of the brachial membrane; hair beneath black, the tip yellowish-white; hind-feet rather long, a few setæ extending over the nails; only a minute portion of the tail protrudes beyond the membrane; total length, two inches and one-tenth; tail, one and one-fifth.

This encampment was situated about eighteen miles above the confluence of that tributary of the Arkansa called, in Pike's map, "The First Fork;" and by our computation near one hundred miles from the base of the mountain. James's Peak was still visible, bearing north, 68° west; and the Spanish peaks, the westernmost of which bore south, 40° west. The observations made here received the most minute and careful attention. The moon was at this time too near the sun to admit of taking her distance from that luminary, and too near Antares

for an observation. The distance of Spica Virginus was too great, and the star was too near the horizon; yet we trust accurate deductions may be made from the distances which are given in the Appendix.

On the evening of both days which our Kaskaia spent with us, we observed him to commence soon after sunset a monotonous and somewhat melancholy song, which he continued for near an hour. He gave us some account of a battle which had lately been fought between the Tabba-boos (Anglo-Americans) and the Spaniards, in which great guns had been used, and when the Spaniards, though superior in number, had been beaten. He appeared well acquainted with the use of fire-arms, and challenged one of the party to a trial of skill in shooting at a mark with the rifle. He had a fusee, kept very carefully in a case of leather, and carried, when travelling, by his squaw. He was also armed with a bow and some light arrows for hunting, which he carried constantly in his hand. He took his leave of us on the morning of the 23d, having received several presents, with which he appeared highly pleased.

The Arkansa, between this point and the mountains, has a rapid current, whose velocity probably varies from five to six miles per hour. It may be forded at many places in a moderate stage of water. The average breadth of the river is from sixty to seventy-five yards; at many places, however, it is much enlarged, including numerous islands. It pursues a remarkably serpentine course within its valley, forming a succession of points on both sides of the river; which, together with the islands, are usually covered with cotton-wood. The bed of the river is gravelly, or composed of waterworn stones, which diminish in size as you recede from the mountains. The water is turbid, but in a less remarkable degree than that of the Platte. The bed of the river has, in many instances, changed its place; and the old

channel is sometimes occupied by stagnant water, and sometimes by a small stream, which is rendered transparent by passing through the sand and gravel, forming the recently-raised bank of the river.

On the 24th the movements of the party were resumed. Major Long, with the division destined to Red river, crossed the Arkansa at five A. M. On arriving at the opposite bank three cheers were given, which our late companions returned from the other side. We lost sight of them as they were leaving the camp to descend the Arkansa.

The party, consisting of ten men, took with them six horses and eight mules, most of them in good condition for travelling. A few had sore backs, but one horse only was unfit for service.

Our course was a little to the east of south, nearly at right angles to the direction of the Arkansa. It was our intention to cross to and ascend the First Fork, a considerable stream, entering the Arkansa eighteen miles below our last encampment. After leaving the river we found the surface to rise gradually till, at the distance of six or eight miles, it is broken by a few small gravelly ridges. These are of little elevation; and their summits overlook an extensive waste of sand, terminated towards the south and east only by the verge of the sky, on the west and north-west by the snowy summits of the Spanish mountains. As our way led across the general course of the stream, we met with no water, except such as was still standing in puddles, which had been filled by the last night's rain. Near one of these we halted to dine. The thermometer, hanging in the shade of our tent, the most perfect, and indeed the only shade we could find, stood at 100°. The little water we could procure was thick with mud, and swarming with the larva of mosquitos; but this we regretted the less, as we had no cooking to perform. We dined upon jerked meat from our packs. Some animals, seen at a distance,

were at first mistaken for bisons; but were found, by the hunters sent in pursuit of them, to be horses, and too wild and vigilant to be taken.

A species of cone-flower (rudbeckia tagetes) [86], with an elongated receptacle, and large red brown radial florets, was observed about the margin of the stagnant pool near which we halted.

We also collected the linum rigidum, and a semi-procumbent species of sida, which appears to be undescribed. It is a little larger than the S. spinosa, to which it has some general resemblance.

The whole tract passed in this day's journey of twenty-seven miles, is sterile and sandy. At sunset we were so fortunate as to meet with another small pool of water, by which we pitched our tent, and kindled a fire with the dung of the bison. Since leaving the Arkansa, we had scarcely seen so much wood as, if collected, would have supplied us for a single night.

We passed, in the course of the day, not less than four or five paths, leading south-west, towards the Spanish settlements. Some of them appeared to have been recently travelled by men with horses, such paths being easily distinguished from those of bisons or wild horses.

Our camp was near the head of a dry ravine, communicating to the south-west, with a considerable stream, which we could distinguish at the distance of eight or ten miles, by a few trees along its course. Continuing our journey on the ensuing day, July 25th, we soon found ourselves in a tract of country resembling that on the Arkansa near the mountains. A similar horizontal slaty sandstone occurs, forming the basis of the country. There is also here a coarse, somewhat crystalline, variety, resembling that of St. Michael's in the lead mine district, but exhibiting no trace of metallic ores. These rocks are deeply channeled by the watercourses, sunk to a great depth, but at this time containing but little, if any,

water. These ravines are, the greater number of them, destitute of timber, except a few cedars, attached here and there in the crevices of the rock. The larger valleys, which contain streams of water, have a few cotton-wood and willow trees. The box elder, the common elder, (sambucus canadensis,) and one or two species of biburium are seen here.

It was perhaps owing to our having followed more carefully than they deserved, the directions of the Calf, that we did not arrive as early as we had expected, upon the stream we designed to ascend. In the middle of the day on the 25th, we fell in with a small river, at the distance of thirty-six miles from the point where we had left the Arkansa. This we concluded could be no other than that tributary, whose mouth is said to be distant eighteen miles from the same spot. This stream, where we halted upon it to dine, is about ten yards wide and three feet deep, but appeared at this time unusually swollen. Its immediate valley is about three hundred yards in width, bounded on both sides by perpendicular cliffs of sandstone, of near two hundred feet elevation. A very large part of the area included between these, showed convincing evidence, in the slime and rubbish with which its surface was covered, of having been recently inundated. This stream, like all others of similar magnitude, having their sources in high mountains, is subject to great and sudden floods. A short time before we halted, our two hunters, Verplank and Dougherty, were sent forward to hunt, and joined us with a deer soon after we had encamped.

After dinner we moved on, ascending the creek above mentioned, whose valley was sufficiently wide for a little distance, to afford us an easy and unobstructed passage. The stream runs nearly from south to north, in a deep, but narrow and tortuous valley, terminated on both sides by lofty and perpendicular precipices of red sand rock. This sand-

stone appears entirely to resemble that before mentioned, as occurring in an inclined position along the base of the mountains, on the Arkansa and Boiling-spring creek. Here it is disposed in horizontal strata of immense thickness; it varies in colour, from a bright brick red to a dark, and is sometimes grey, yellow, or white. It consists essentially of rounded particles of quartz and other siliceous stones, varying in size from the finest sand to gravel stones and large pebbles. Extensive beds of pudding-stone occur in every part of it, but are abundant somewhat in proportion to the proximity of the high primitive mountains. In the lower parts of the stratum these beds of coarse conglomerate appear to have the constituent gravel and pebble-stones more loosely cemented than in portions nearer to the upper surface; wherever we have met with them in immediate contact with the granite of the Rocky Mountains, they are nearly destitute of cement, and of a colour approaching to white. This remark, it is highly probable, may not be applicable to many extensive beds of pudding-stone which lie near the base of the mountains. In the instances which came under our notice, the absence of colour and the want of cement may very probably have been accidental. The finer varieties of the sandstone are often met with in the immediate neighbourhood of the granite, and are of a compact structure, and an intense colour. Red is the prevailing colour in every part of the stratum, but stripes of yellow, grey, and white, are frequently interspersed. In hardness and other sensible properties, it varies widely at different points. In many instances it is entirely similar to the sandstone about New Brunswick, in New Jersey, at Nyac, and along the Tappan bay, in New York, and particularly that variety of it which is quarried at Nyac, and extensively used in the cities of New York and Albany for building. It contains a little mica in small scales; oxyde of iron predominates in the cement, and the ore de-

nominated the brown oxyde, occurs in it in seniform botryoidar and irregular masses.

A few miles above our mid-day encampment, we entered the valley of a small creek, tributary from the south-east to the stream we had been ascending; but this we found so narrow and so obstructed by fallen masse of rock, and almost impenetrable thickets of alders and willows, as to render our progress extremely tedious and painful. We were several times induced to attempt passing along the bed of the stream, but as the mud was in many places very deep, this was done at the cost of the most violent and fatiguing exertions on the part of our horses, and the risk to ourselves of being thrown with our baggage into the stream. With the hope of finding an easier route across the hills, we ascended with much difficulty a craggy and abrupt ravine, until we had attained nearly the elevation of the precipitous ramparts which hemmed in the narrow valley of the creek; but all we gained by this ascent was the opportunity of looking down upon a few of our companions still lingering below, diminished to the stature of dwarfs by the distance, and by contrast with the rude and colossal features of the scene. The surface of the country extending on both sides from the summit of the precipices, consisted of abrupt conic piles, narrow ridges, and shapeless fragments of naked rocks, more impassable than the valley below. Counselled therefore by necessity, we resumed our former course, ascending along the bed of the creek.

Among other birds which occurred in this day's march, we noticed the yellow-bellied fly catcher and the obscure wren.

One of the small striped ground-squirrels already noticed was killed, and an individual belonging to another species [37], distinguished by the extraordinary coarseness and flattened form of the fur, and by three black lines on each side of the tail; these

lines at their tips are of course united over the surface of the tail as in the Barbary squirrel. It nestles in holds and crevices of the rocks, and does not appear to ascend trees voluntarily.

It appears to inhabit principally about the naked parts of the sandstone cliffs, or where there are only a few cedar bushes. In the pouch of the specimens killed, we found the buds and leaves of a few small plants, common among the rocks.

Following up the bed of the creek, we ascended by a gradual elevation to the surface of the stratum of red sandstone. It is separated by a somewhat distinct boundary from the finer and more compact grey variety which rests upon it. This grey sandstone appears from the organic relics it contains, as well as from its relative position, to have been of more recent deposition than the red. Its prevailing colours are grey or yellowish white; its stratifications distinct; and its cement often argillaceous.

After entering upon this variety, we found the valley of the creek less circuitous in direction, but narrower and more obstructed by detached fragments than below. The impaling cliffs on each side were also more uniformly perpendicular, putting it out of our power to choose any other path than the rugged one before us. As with every step of our advance upon this route, we were gaining a little in point of elevation, we hoped by following it to reach at length its termination in the high and open plain, which we had no doubt existed, extending over the greater part of the surface of the country, wherever the strata of sandstone were still unbroken. At five P. M., supposing we had arrived very near this much-wished-for spot, and finding an indifferent supply of grass for our horses, we halted for the night, having travelled fifteen miles.

July 26th. The water of the large stream we had crossed, and ascended for some distance on the pre-

ceding day, was turbid, and so brackish as to be nauseous to the taste. The same was observed, though in a less remarkable degree, of the little tributary we had followed up to our encampment. After leaving the region of red sandstone, we found the water to become perceptibly purer. In the districts occupied by that rock, we have observed several copious springs, but not one whose waters were without a very manifest impregnation of muriate of soda, or other saline substances. In the gray or argillaceous sandstone springs are less frequent, but the water is not so universally impure.

A beautiful dalea, two or three euphorbias, with several species of eriogonum, were among the plants collected about this encampment. Notwithstanding the barrenness of the soil and the aspect of desolation which so widely prevails, we are often surprised by the occurrence of splendid and interesting productions springing up under our feet, in situations that seemed to promise nothing but the most cheerless and unvaried sterility. Operating with unbounded energy in every situation, adapting itself with wonderful versatility to all combinations of circumstances; the principle of life extends its dominion over those portions of nature which seem as if designed for the perpetual abode of inorganic desolation, distributing some of its choicest gifts to the most ungenial regions; fitting them by peculiarity of structure, for the maintenance of life and vigour, in situations apparently the most unfavoured.

At nine o'clock in the evening of the 25th, a fall of rain commenced; we were now ten in company, with a single tent, large enough to cover half the number. In order, however, to make the most equal distribution of our several comforts, it was so arranged that about the half of each man was sheltered under the tent, while the remainder was exposed to the weather. This was effected by placing all our heads near together in the centre of the tent, and

allowing our feet to project in all directions, like the radii of a circle.

On the ensuing morning we commenced our ride at an early hour, being encouraged still to pursue the course up the ravine, by a bison path, which we believed would at length conduct us to the open plain. Our progress was slow and laborious, and our narrow path so hemmed in with perpendicular cliffs of sandstone, that our views were nearly as confined, and the surrounding objects as unvaried as if we had been making our way in a subterranean passage. Two black-tailed deer, with a few squirrels, and some small birds, were all the animals seen in the course of the day. Some enormous tracks of the grizzly bear, with the recent signs of bisons, afforded sufficient proof that these animals, though unseen, were near at hand.

Our courses were nearly south during the day, and the distance we travelled, estimated on them, fifteen miles. The actual distance passed must have been much greater, as our real course was extremely circuitous, winding from right to left in conformity to the sinuosities of the valley.

At 4 o'clock we arrived at the head of the stream which we had hitherto ascended; as we were conscious that after leaving this, and emerging into the open country, we could not expect to meet with water again in a distance of several miles, it was resolved to halt here for the night, and the hunters were sent out. Soon afterwards it began to rain. At sun-set the hunters returned, having killed a female of the black-tailed or mule deer. The flesh of this we found in tolerable condition, and extremely grateful to our hungry party.

On the morning of the 27th, we rose at 3 o'clock, and hastened our preparations for an early start. The morning was clear and calm, and the copious dew which was beginning to exhale from the scanty herbage of the valley, gave to the air a delightful

freshness. The mercury, as on several of the preceding mornings, stood at about 55°. At sun-rise we resumed our toilsome march, and, before 10 o'clock, had arrived at a part of the valley, beyond which it was found impossible to penetrate. The distance we had travelled would have been, in a direct line, about three miles; in passing it we had followed no less than ten different courses, running in all possible directions. This fatiguing march had brought us to a point where the valley was so narrow, and so obstructed with large detached rocks, as to be entirely impassable on horseback. We were therefore under the necessity of halting, and as the place afforded some grass, our horses were turned loose to feed, while several persons were sent to discover, if possible, some passage by which we might extricate ourselves from the ravine. One of them at length returned, having found at the distance of a mile and a half below, a pass where it was thought our horses could be led up the cliff.

On the preceding day we had commenced our accustomed march in a valley bounded by perpendicular cliffs of red sandstone, having an elevation of at least two hundred feet. As we ascended gradually along the bed of the stream, we could perceive we were arriving near the surface of this vast horizontal bed of sandrock, and at night we pitched our tent at the very point where the red sandstone began to be overlaid in the bed of the creek by a different variety. This second variety, the gray sandstone, is a horizontal stratum, evidently of more than two hundred feet in thickness. It is usually more compact and imperishable than the red, its fragments remaining longer entire, and retaining the angles and asperities of the surface, which in the other variety are soon softened down by the rapid progress of disintegration.

It is easy to perceive that the sandstone formation, including the two varieties above mentioned,

must be at this point of immense thickness. Fifteen hundred feet is probably a very moderate estimate for the aggregate elevation of some insulated, but extensive portions of the gray sandstone, above that part of the valley at which the red sandstone first appears. From this point downwards, the extent of the latter variety may be very great, but no estimate can be formed which would be in any measure entitled to confidence.

After we had dined we retraced our two last courses, and succeeded in ascending the cliff at the place which one of the hunters had pointed out, taking, without the least regret, our final leave of the "valley of the souls in purgatory."*

From the brow of the perpendicular precipice, an ascending slope of a few rods conducted us through scattering groves of junipers, to the border of the open plain. Here the interminable expanse of the grassy desert burst suddenly upon our view. The change was truly grateful. Instead of a narrow crooked avenue, hedged in by impending cliffs and frightful precipices, a boundless and varied landscape lay spread before us. The broad valley of the Arkansa, studded with little groves of timber, and terminated in the back ground by the shining summit of James's Peak, and numerous spurs of the Rocky Mountains, with the snowy pinnacles of the more distant ranges, limited our view on the right; on our left, and before us, lay the extended plain, diversified with vast conic mounds, and insulated table-like hills, while herds of bisons, antelopes, and wild horses, gave life and cheerfulness to the scene.

A large undescribed species of the gaura is com-

* This tributary of the Arkansa, designated on the old maps as the "First Fork," is known among the Spaniards of New Mexico, as the river of the souls in purgatory. We emerged from the gloomy solitude of its valley, with a feeling somewhat akin to that which attends escape from a place of punishment.

mon about the banks of all the creeks we had seen since leaving the Arkansa. It attains, ordinarily, the size of G. biennis, but is clearly distinct both from that and all other North American species. It has a broader leaf than any other of the genus met with in this country. The flowers are small, of a purple colour, and incline to form a terminal spike. The whole plant is covered with a dense silky pubescence, and is remarkably soft to the touch. We propose to call it gaura mollis.

After travelling one mile and a half into the plain in a due south course, we halted to take the bearings of several remarkable points. Due east was a solitary and almost naked pile of rocks towering to a great elevation above the surface of the plain. James's Peak bore north 71° west; the west Spanish Peak, south 87°. West magnetic variation, 13½ deg. east. As we proceeded, we were surprised to witness an aspect of unwonted verdure and freshness in the grasses and other plants of the plains, and in searching for the cause of this change, we discovered we had arrived at a region differing both in point of soil and geological features from any portion of the country we had before seen. Several circumstances had induced us to conjecture that rocks of the newest fletz trap formation, existed in some portions of the secondary region along the eastern declivity of the Rocky Mountains; but until this time we had met with no positive confirmation of the opinion. We were glad to be at length relieved from the tiresome sameness of the sand formation, and promised ourselves in the treasures of a new and more fertile variety of soil, the acquisition of many important plants.

At five P.M. we met with a little stagnant water, near which we encamped, having travelled about ten miles nearly due south from the point where we had left the valley of the creek. The hunters went out on foot in pursuit of bisons, several herds being

in sight; but returned at dark, having effected no more than to break the shoulder of a young bull, who ran off, pursued by a gang of wolves. Several of the party understanding the route the animal had taken, and instigated in common with the wolves by the powerful incitement of hunger, resolved to join the chase, and to dispute with their canine competitors the possession of the prey. When they had nearly overtaken the bison, they saw him several times thrown to the ground by the wolves, and afterwards regaining his feet. They soon came near enough to do execution with their pistols, and frightened away the wolves only to make a speedier end of the harrassed animal. It was now past nine o'clock, but the starlight was sufficient to enable them to dress the meat, with which they returned loaded to camp, and spent the greater part of the night in regaling on the choice pieces.

Friday, July 28th. From an elevated point, about eight miles south of our encampment of last evening, the high peak at the head of the Arkansa was still visible when we passed this morning. From a computation of our courses and distances we find we cannot, according to our estimate, be less than one hundred and thirty miles distant from its base; but the air at this time happened to be remarkably clear, and our elevation above the common level of the plain considerable. By referring to Pike's "Journal of a Voyage to the Sources of the Arkansa," it will be seen that this peak is the most prominent and conspicuous feature in a great extent of the surrounding country. "It is indeed so remarkable as to be known to all the savage nations for hundreds of miles around, and to be spoken of with admiration by the Spaniards of New Mexico, and was the bounds of their travels north-west. Indeed, in our wanderings in the mountains, it was never out of sight, except when in a valley, from the 14th of November to the 27th of January." See page 171.

Notwithstanding this representation, and the fact that the peak in question was seen by ourselves at the distance of one hundred and thirty miles, we are inclined to the opinion, that in point of elevation, it falls far below many portions of the interior ridges of the mountains which are visible from its summit, and from the plains of the Platte, and that it is by standing a little detached from the principal group of the mountains, it acquires a great portion of the imposing grandeur of its appearance.

In the forenoon of this day we passed some tracts of grey sandstone; having, however, met with several inconsiderable conic hills belonging to that interesting formation, called by the disciples of Werner, the fletz trap rocks. We perceived before us a striking change in aspect and conformation of the surface. Instead of the wearisome uniformity, the low and pointless ridges which mark the long tract of horizontal sandstone we had passed, we had now the prospect of a country varied by numerous continued ranges of lofty hills, interspersed with insulated cone-like piles, and irregular masses of every variety of magnitude and position. This scenery is not to be compared in point of grandeur with the naked and towering majesty of the great chain of the Andes, which we had lately left, but in its kind it is of uncommon beauty. The hills, though often abrupt and high, are sometimes smooth and grassy to their summits, having a surface, unbroken by a single rock or tree, large enough to be seen at the distance of a mile.

At noon we halted near the base of a hill of this description. It is of greenstone, and the sandrock on which it rests is disclosed at the bottom of a ravine which commences near the foot of the hill. This latter rock is of a slaty structure, and embraces narrow beds of bituminous clay slate, which contains pieces of charcoal, or the carbonised remains of vegetables, in every possible respect resembling the char-

coal produced by the process of combustion in the open air. In the ravines and over the surface of the soil we observed masses of a light porous reddish-brown substance, greatly resembling that which is so often seen floating down the Missouri, and has by some been considered a product of tseudo-volcanic fires, said to exist on the upper branches of that river.* We also saw some porphyritic masses with a basis of greenstone, containing crystals of felspar.

In the afternoon several magpies, shore larks, and cow buntings were seen. One of the cow buntings followed us five or six miles, alighting on the ground, near the foremost of our line, and within a few paces of our horses' feet, where he stood gazing at the horses until all had passed him, when he again flew forward to the front, repeating the same movement many times in succession.

We had now arrived near that part of the country, where, according to the information of the Kaskaia, we expected to find the remarkable saline spring from which we were told the Indians often procured large masses of salt. The Kaskaia had, by the aid of a map traced in the sand, given us a minute account of the situation of the spring and of the surrounding country, stating that the salt existed in masses at the bottom of a basin-like cavity, which contained about four and a half feet of reddish water. Thus far we had not found a single feature of the country to correspond in the slightest degree to his descriptions, and as we had been careful to follow the general direction of the course he pointed out to us, it was probably his intention to deceive.

Our course, which was a little east of south, led us across several extensive valleys, having a thin dark coloured soil, closely covered with grasses, and strewed with fragments of greenstone. Descending towards levening into a broad and deep valley, we

* See Bradbury's Travels, p. 161, second edition.

found ourselves again immured between walls of grey sandstone, similar in elevation and all other particulars to those which limit the valley of Purgatory Creek. It was not until considerable search had been made, that we discovered a place where it was possible to effect the descent, which was at length accomplished, not without danger to the life and limbs of ourselves and horses. The area of the valley was covered with a sandy soil. Here we again saw the great cylindric cactus, the cucumis, and other plants common to the sandy districts, but rarely found in the scanty soils of the fletz trap formation. Pursuing our way along this valley, we arrived towards evening at an inconsiderable stream [38] of transparent and nearly pure water, descending along a narrow channel paved with black and shapeless masses of amygdaloidal and imperfectly porphyritic greenstone. This was the first stream we had for a long time seen traversing rocks of the secondary formation, whose waters were free of an impregnation of muriate of soda and other salts. From the very considerable magnitude of the valley, and the quantity of water in the creek, it is reasonable to infer, that its sources were distant at least twenty miles to the west, and the purity and transparency of its waters afford sufficient evidence that it flows principally from a surface of trap rocks.

Having crossed the creek with some difficulty, we halted on its bank to set up our tent, and prepare ourselves for a thunder shower, which was already commencing. After the rain, the sky became clear, and the sun, which was near setting, gilded with its radiance the dripping foliage of a cluster of oaks and poplars, which stood near our tent. The grassy plain, acquiring an unwonted verdure from the shower, and gemmed with the reflection of innumerable pendant rain-drops, disclosed here and there a conic pile, or a solitary fragment of black and porous amygdaloid. The thinly-wooded banks of the creek

resounded to the loud notes of the robin, and the more varied and melodious song of the mocking-bird; the stern features of nature, which we had long contemplated with a feeling almost of terror, seemed to relax into a momentary smile to cheer us on our toilsome journey.

On the morning of the 29th, our course (S. 35° E.) brought us at the distance of three miles from our camp, to the foot of the cliff which separates the valley from the high plain. This mural barrier has an elevation of about two hundred feet, and is impassable, except at particular points, where it is broken by ravines. One of these we were fortunate in finding, without being compelled to deviate greatly from our course, and climbing its rugged declivity, we emerged upon the broad expanse of the high plain. Turning with a sort of involuntary motion towards the west, we again caught a view of the distant summits of the Andes appearing on the verge of our horizon. The scene before us was beautifully varied with smooth valleys, high conic hills, and irregular knobs, scattered in every direction as far as the eye could comprehend. Among these singular eminences nothing could be perceived like a continuous unbroken range. Most of them stand entirely isolated; others in groups and ranges, but all are distinct hills, with unconnected bases. The surface of the country generally, and more especially in the immediate vicinity of these hills, is strewed with fragments of compact or porphyritic greenstone. These are, in some places, accumulated in such quantities as render the passing extremely difficult.

At half-past eleven, A. M., a violent storm, with high and cold wind, came on from the north-east, and continued for two hours. Soon after its commencement we halted to dine, but were unable to find a spot affording wood until so much rain had fallen as to wet our clothing and baggage. Fire was almost the only comfort we could now command, our

provisions being so nearly exhausted, that about an ounce of jerked bison meat was all that could be allowed each man for his dinner.

The rain ceasing, we again resumed our journey, but had not proceeded far when we were overtaken by a second storm from the north-east, still more violent than the first, and attended with such pelting hail that our horses refused to proceed in any direction except that of the wind, so that rather than suffer ourselves to be carried off our course, we were compelled to halt, and sit patiently upon our horses; opposing our backs to the storm, we waited for its violence to abate. As soon as the hail ceased we moved on, the water pouring in streams from our mockasins and every part of our dress. The rain continued until dark, when, being unable to find wood, and having no occasion for water, we halted, and without the delay of cooking supper, or eating it, we set up our tent, and piled ourselves together under it in the most social manner possible. During the day, the mercury had fallen from 70° to 47°, indicating a change of temperature, which was the more severely felt, as we were hungry, wet, and much fatigued. As we had neither dry clothing or blankets, we could find no other method of restoring the warmth to our benumbed bodies than by placing them together in the least possible compass. We spent a cheerless night, in the course of which Mr. Peale experienced an alarming attack of a spasmodic affection of the stomach, induced probably by cold and inanition. He was somewhat relieved by the free use of opium and whiskey.

30th. We left our comfortless camp at an early hour on the ensuing morning, and traversing a wide plain strewed with fragments of greenstone, amygdaloid, and the vesicular substance already mentioned as the pumice-stone of Bradbury, we arrived in the middle of the day in the sight of a creek, which, like all the watercourses of this region,

is situated at the bottom of a deep and almost inaccessible valley. With the customary difficulty and danger, we at length found our way down to the stream, and encamped.

We were much concerned, but by no means surprised, to discover that our horses were rapidly failing under the severe services they were now made to perform. We had been often compelled to encamp without a sufficiency of grass, and the rocky travelling, to which we had for some time accustomed them, was wearing out and destroying their hoofs. Several were becoming lame, and all much exhausted and weakened.

Verplank, our faithful and indefatigable hunter, was so fortunate as to kill a black-tailed deer at a distance from our course. A horse was, however, sent for the remainder of the meat, Verplank having brought the greater part of it on his shoulders; and we once more enjoyed the luxury of a full meal.

In the course of the day we saw several antelopes, all more wild and shy than those between the Pawnee villages and the Missouri. Also a few wild horses, but it was easy to see that all the animals inhabiting this portion of the country had been accustomed to be hunted. Few traces of bison, either old or recent, were to be seen. From these facts we inferred that we were now on the frontiers of some permanent settlement, either of Spaniards or Indians.

CHAPTER XI.

SUFFERINGS OF THE PARTY FROM STORMY WEATHER AND WANT OF PROVISIONS.—INDICATIONS OF AN APPROACH TOWARDS SETTLEMENTS.—INSCRIBED ROCK.—CERVUS MACROTIS.—VOLCANIC ORIGIN OF AMYGDALOID.

The valley in which we halted, is narrow and bounded on both sides by cliffs of greenstone, having manifestly a tendency to columnar or polyedral structure. It falls readily into large prismatic masses, but obstinately resists that further progress of disintegration which must take place before it can be removed by the water. For this reason the valley is much obstructed by fallen masses retaining their angular form, and little intermixed with soil. The common choke cherry, and the yellow and black currants, are almost the only woody plants met with in this valley.

The stream which may be supposed to exist in it for a part of the year at least, but which was now dry, runs towards the south-east. Having arrived at that part of the country which has by common consent been represented to contain the sources of the Red river of Louisiana, we were induced, by the general inclination of the surface of the country and the direction of this creek, to consider it as one of those sources; and accordingly resolved to descend along its course, hoping it might soon conduct us to a country abounding in game, and presenting fewer obstacles to our progress than that in which we now were. Our sufferings from the want of provisions, and from the late storm, had given us a little distaste for prolonging farther than was necessary our journey towards the south-west. And our horses

failing so rapidly, that we did not now believe they would hold out to bring us to the settlements by the nearest and easiest route.

The country between the sources of Purgatory creek and the stream on which we were now encamped, is a wide and elevated formation of trap rocks, resting upon horizontal sandstone. It has a loose and scanty soil, in which sand, gravel, and rolled pebbles are rarely seen, except in the vicinity of some parts where the sandstone appears to have been uncovered by the action of currents of water. In traversing it we had collected many new and interesting plants. Among these were a large decumbent mentzelia, an unarmed rubus, with species of astragalus, pentstemon, myosotis, helianthus, &c. Beside the common purslane, one of the most frequent plants about the mountains, we had observed on the Arkansa a smaller species, remarkably pilose about the axils of the leaves, which are also narrower than in P. oleracea. A very small cuscuta also occurs almost exclusively parasitic on the common purslane.

July 31st. In attempting to descend the creek from our last encampment, we found the valley so obstructed with fragments of greenstone as to be wholly impassable. We accordingly ascended into the plain; and continuing along on the brink of the precipice, arrived in a few hours at a point where the substratum of sandstone emerges to light at the base of an inconsiderable hill. It is a fine gray sandstone, having an argillaceous cement, and its lamina are so nearly horizontal, that their inclination is not manifest to the eye. It is smooth and fissile, and in every respect remarkably contrasted to the massive and imperfectly columnar greenstone which it supports.

The greenstone of this district is not universally characterized by any tinge of green in the colouring, but often, as in the instance of which we are speaking, its colour is some shade of gray, varying from light

gray to grayish black. The hornblende and felspar which enter into its composition, are minutely and intimately blended. Its minute structure is rarely, if ever distinctly crystalline; most frequently it is compact, and the fracture nearly even.

The hunters were kept constantly forward of the party, and in the course of the morning they killed a small fawn and a heron. At one o'clock we arrived at the confluence of a creek tributary from the east to the stream we were following, and descending into its valley by a precipitous declivity of about four hundred feet, we encamped for the remainder of the day. This valley is bounded by perpendicular cliffs of sandstone, surmounted by extensive beds of greenstone. The fragments of the latter have fallen down into the valley, and being less perishable than the sandstone, they constitute the greater part of the *débris* accumulated along the base of the cliffs.

The sand-rock, which in some places is exposed in perpendicular precipices, is soft and friable, being very readily scratched with the point of a knife, and has been rudely inscribed, probably by the Indians, with emblematic figures commemorative of some past event. Several of the figures intended to represent men are distinguished by the sign of the cross inscribed near the head; some are represented smoking, and some leading horses, from which we infer, that the inscriptions are intended to commemorate some peaceful meeting of the Indians with the Spaniards of N. Mexico for purposes of trade, when horses were either given as presents or bartered for other articles. Some meeting of this kind has probably happened here at no very distant period, as corn cobs were found near our encampment. From this circumstance it would appear, that the distance to the Spanish settlements cannot be very great.

Mr. Peale, who had been unwell since the cold storm of the 28th, now found some relief in the

opening of an abscess which had formed upon his jaw. As several of our horses had been lamed in descending into the valley, and by the rough journey of the preceding day, it was thought necessary to allow ourselves a day of rest. Since arriving in the country inhabited by the hitherto undescribed animal called the black-tailed or mule deer, we had been constantly attentive to the important object of procuring a complete specimen for preservation and description. Hitherto, though several had been killed, none had been brought to camp possessing all the characters of the perfect animal. Supposing we should soon pass beyond their range, a reward had been offered to the hunter who should kill and bring to camp an entire and full-grown buck.

Verplank killed one of this description, on the afternoon of the 1st of August, near enough our camp to call for assistance, and bring it in whole. They did not arrive until dark, and we had such pressing necessity for the flesh of the animal, that we could not defer dressing it until the next morning. The dimensions were accordingly taken, and a drawing made by Mr. Peale, the requisite light being furnished by a large fire. Verplank informed us, that in company with the buck which he killed, were five does, two of the common red deer, (C. virginianus) and three of the other kind. [39]

We observed about this camp, a yellow-flowering sensitive plant, apparently a congener to the saw-brier, (schrankia uncinata) of the Platte and Arkansa. Its leaves are twice pinnated, and manifestly irritable. We also added to our collection, two new species of gaura, smaller than G. mollis, which is also found here.

Several rattle-snakes were seen, and many orbicular lizards. These are evidently of two different species, differing from each other in the length of the spines and position of the nostrils. Scarce any two of either species are precisely similar in colour, but the markings are permanent. Both species possess, in a slight

degree, the power of varying the shades of colour. We can find no conspicuous difference, marking the different sexes in the species with long spines; the other we have not had sufficient opportunity to examine.

Wednesday, August 2d. The rain which had fallen during great part of the preceding day and night, had considerably raised the water in the small creek on which we were encamped. At sunrise we collected our horses and proceeded down the valley, the direction of our course south, 30° east. At the distance of two or three miles we found the valley much expanded in width, and observed a conspicuous change in the sandstone precipices which bound it. This change is the occurrence of a second variety of sand-rock, appearing along the base of the cliff, and supporting the slaty argillaceous stratum already described. These rocks have precisely the same position relative to each other, and nearly the same aggregate elevation, as the two very similar varieties observed in the valley of Purgatory creek; indeed, the conclusion that they are the continuation of the same strata as appeared similarly exposed in that valley, can scarcely be avoided. The lowermost, or red sand-rock, is here very friable and coarse. Its prevailing colour is a yellowish grey or light brown. It is often made up almost exclusively of large rounded particles of white or transparent quartz, united by a scanty cement, which usually contains lime, and sometimes, but not always, oxide of iron. In some instances the cement seems to be wanting. Its stratifications are very indistinct compared to those of the gray sandstone, and like them disposed horizontally.

On entering the wider part of the valley, we perceived before us, insulated in the middle of the plain, an immense circular elevation, rising nearly to the level of the surface of the sandstone table, and apparently inaccessible upon all sides. On its summit

is a level area of several acres, bearing a few cedar bushes, probably the habitation of birds only.

Leaving this, we passed three others in succession similar to it in character, but more elevated and remarkable. Of one of them, Mr. Peale has preserved a drawing. After passing the last of these, the hills ceased abruptly, and we found ourselves once more entering a vast unvaried plain of sand. The bed of the creek had become much wider, but its water had disappeared. Meeting at length with a stagnant pool, we halted to dine, but found the water more bitter and nauseous than that of the ocean. As it could neither be used for cooking or to drink, we made but a short halt, dining on a scanty allowance of roasted venison, which we ate without bread, salt, water, or any thing else. Some fragments of amygdaloid were strewed along the bed of the stream, but we saw no more of that rock, or of the other members of the fletz trap formation in place. They may extend far towards the south-west, but of this we have no conclusive evidence. The aspect of these rocks, particularly of the amygdaloid or toad stone, is so peculiar, and its disposition so remarkably dissimilar to that of the sandstones with which it is associated, that nothing seems more natural than that it should be referred to a different origin.

In the midst of one of the violent storms we encountered in passing this trap formation, we crossed the point of a long and inconsiderably elevated ridge of amygdaloid, so singularly disposed as to suggest to every one of the party the idea that the mass had once been in a fluid state; and that, when in that state, it had formed a current, descending along the bed of a narrow ravine, which it now occupied, conforming to all the sinuosities and inequalities of the valley, as a column of semifluid matter would do. Its substance was penetrated with numerous vasicular cavities, which were observed to be elongated in the direction of the ridge. Its colour is nearly

black, and when two masses are rubbed together, they yield a smell somewhat like the soot of a chimney. These appearances are so remarkable, that it is not at all surprising these rocks should have been considered of volcanic origin; and it is this supposition unquestionably from which has originated the statement contained in the late map of the United States by Mellish, that the district about the sources of Red river is occupied by volcanic rocks; the information having probably been derived from the accounts of hunters.

The valleys which penetrate into the sandstone supporting these trap rocks, have usually a sandy soil, while that of the more elevated portions, though inconsiderable in quantity, is not sandy nor intermixed with pebbles or gravel. Among the few scattered and scrubby trees met with in this district, are oaks, willows, and the cotton-wood; also a most interesting shrub or small tree, rising sometimes to the height of twelve or fourteen feet. It has dioecious flowers, and produces a leguminous fruit, making in several particulars a near approach to gladitschia; from which, however, it is sufficiently distinguished by the form of the legume, which is long and nearly cylindric, and by the seeds, which are enclosed in separate cells, immersed in a saccharine pulp, but easily detached from the valves of the legume. In these particulars it discovers an affinity to the tamarind of the West Indies. The legume or pod, which is from six to ten inches long, and near half an inch in diameter, contains a considerable quantity of a sugar-like pulp, very grateful to the taste when ripe. The leaves are pinnated, and the trunk beset with spines, somewhat like the honey locust, but the spines are simple. Our Spanish interpreter informs us, that it is found about Monterrey, and other parts of the internal provinces, where it must have been noticed by Humboldt, but we have not been able to have access to his account of it. In the afternoon we travel-

led thirteen miles, descending along the valley in a south-east direction. We extended our ride farther than we had wished, finding no suitable place to encamp. After sunset we found a small puddle of stagnant water in the bed of the creek, which, though extremely impure, was not as bitter as that near which we halted in the middle of the day. Neither wood nor bison dung could be found, so that being unable to kindle a fire, we were compelled to rest satisfied with the eighth part of a sea biscuit each for supper, that being the utmost our supplies would allow. In the afternoon one of our hunters had killed a badger; this was all the game we had, and this we were compelled to reserve until we could make a fire to cook it.

Thursday, 3d. Little delay was occasioned by our preparations for breakfast. The fourth part of a biscuit, which had been issued to each man on the preceding evening, and which was to furnish both supper and breakfast, would have required little time had all of it remained to be eaten, which was not the case. We were becoming somewhat impatient on account of thirst, having met with no water which we could drink for near twenty-four hours; accordingly, getting upon our horses at an early hour, we moved down the valley, passing an extensive tract, whose soil is a loose red sand, intermixed with gravel and small pebbles, and producing nothing but a few sunflowers and sand cherries, still unripe. While we should remain upon a soil of this description, we could scarcely expect to meet with water or wood, for both of which we began to feel the most urgent necessity; and as the prospect of the country before us promised no change, it is not surprising we should have felt a degree of anxiety and alarm, which, added to our sufferings from hunger and thirst, made our situation extremely unpleasant. We had travelled great part of the day enveloped in a burning atmosphere, sometimes letting fall upon

us the scorching particles of sand, which had been raised by the wind, sometimes almost suffocating by its entire stagnation, when we had the good fortune to meet with a pool of stagnant water, which, though muddy and brackish, was not entirely impotable, and afforded us a more welcome treat than it is in the power of abundance to supply. Here was also a little wood, and our badger, with the addition of a young owl, was very hastily cooked and eaten.

Numbers of cow buntings had been seen a little before we arrived at this encampment, flying so familiarly about the horses that the men killed several with their whips.

August 4th. We were still passing through a barren and desolate region, affording no game, and nearly destitute of wood and water. Its soil is evidently the detritus of a stratum of red sandstone and coarse conglomeratic, which is still the basis and prevailing rock. It appears to contain a considerable proportion of lime, and fragments of plaster-stone and selenite are often seen intermixed with it.

Our morning's ride of sixteen miles brought us to a place where the water of the river emerges to view, rising to the surface of that bed of sand beneath which it had been concealed for a distance of more than one hundred miles. The stream is still very inconsiderable in magnitude; the water brackish, and holds suspended so large a quantity of red earth as to give it the colour of florid blood. The general direction of its course inclining still towards the south-east, we were now induced to believe it must be one of the most considerable of the upper tributaries of Red river. A circumstance tending to confirm this opinion was our falling in with a large and much frequented Indian trace, crossing the creek from the west, and following down along the east bank. This trace consisted of more than twenty parallel paths, and bore sufficient marks of having been recently travelled, affording an explanation of

the cause of the alarming scarcity of game we had for some time experienced. We supposed it to be the road leading from the Pawnee Piqua village on Red river to Santa Fé.

Two shrubby species of cactus, smaller than the great cylindric prickly pear noticed near the Rocky Mountains, occur in the sandy plains we were now traversing. One of these, which is about four feet high, and very much branched, has long and solitary spines, a small yellow flower, and its fruit, which is about as large as the garden cherry, is very pleasant to the taste. The fruit of the C. ferox, which was also found here, was now ripe, being nearly as large as an egg, and of a deep purple colour. The jatropha stimulosa, a congener to the manihot or cassada of the West Indies, a cassia, an amorpha, and many new plants, were here added to our collection.

The hunters were kept constantly out during the day, but nothing was killed until evening, when Verplank brought in a young buck, which enabled us to make a full meal, the first we had eaten for several days.

Game in this portion of the country is extremely scarce, and few traces of bisons are to be seen; and as we were travelling along a frequented road, we had some reason to fear this want of game might continue.

A few wild horses had been observed in the course of the day, and towards evening one was seen following the party, but keeping at a distance. At night, after our horses had been staked in the usual manner, near our camp, we perceived him still lingering about, and at length approaching the tent so closely, that we began to entertain some hopes of capturing him alive. In attempting this we stationed a man with a long-noosed rope in the top of a cotton-wood tree, under which we tied a few of our horses; but this plan did not succeed.

On the following morning one of our hunters fortunately discovered the same horse standing asleep under the shade of a tree, and having shot him, returned immediately to camp with the intelligence. We had all suffered so severely from hunger, and our present want of provisions was so great, that instead of questioning whether we should eat the flesh of a horse, we congratulated ourselves on the acquisition of so seasonable a supply. We felt a little regret at killing so beautiful an animal, who had followed us several miles on the day before, and had lingered with a sort of confidence about our camp; but our scruples all yielded to the loud admonitions of hunger. The day being Sunday, and the plain about our camp affording a supply of grass for our jaded horses, we resolved to remain encamped, seizing the opportunity of making observations for latitude, &c. The morning was calm and clear; the mercury at 69° Fah. For five mornings preceding this it had been at 58°, and in the middle of each day rose to above 90°. The moon was now too near the sun to admit of observations by lunar distances; but the meridional altitude of the sun's lower limb was taken with great care, and under circumstances favourable to accuracy, gave 35° 16′ 19″ for the latitude of our encampment.

The river bed in the front of our camp was found by admeasurement to be sixty yards in width, twenty of which were naked sand-bar, the remaining forty covered with water, having an average depth of about ten inches. The current is moderate, the water intensely red, having nearly the temperature and the saltness of new milk. It suspends a great quantity of clay, derived from the cement of the sand-rock; but notwithstanding its impurities, it is more grateful to the taste than any we had met with since leaving the mountains, and though drank in large quantities, produces no unpleasant effect.

Some spots in the low plains had here considerable fertility, depending probably, in some degree, upon the intermixture of a large proportion of calcareous matter with the soil, resulting from the disintegrated sand-rock. Though no extensive formation, a limestone appears, yet the sandstone has, in many instances, a calcareous cement; but is traversed by numerous veins, both of gypsum and carbonate of lime.

The occurrence of the elm and the diospyros indicated a soil at least approaching towards one adapted to the purposes of agriculture. Among great numbers of interesting plants, we found here a gentian, with a flower much larger than G. crinita, an orobanche (probably the O. ludoviciana, N.) a new croton, an ipomopsis, and many others. Notwithstanding the scarcity of game which we had so long felt, we daily saw considerable numbers of antelopes, with some signs of bear, deer, and and turkies; but these animals had acquired all the vigilance which results from the habit of being often hunted, and the entire want of thick forests, and even of solitary trees or inequalities of the surface, to conceal the approach of the hunter, rendered abortive most of our attempts to take them.

The common partridge (perdix virginianus) was seen near this encampment; also the dove, which had never disappeared entirely in all the country we had passed.

Rising at the customary hour on the morning of the 7th, we perceived that a part of our horses were missing. As we were apprehensive that they had been stolen by Indians, a small party was immediately sent to discover the route they had taken; pursuing along their path, the men overtook them at the distance of two or three miles, as they were straying on in search of pasture.

On leaving our camp, we endeavoured to regain the trace on which we had for several days travelled;

but though we spent considerable time in the search, and travelled several miles off our course, we were not able to find it. This we had occasion to regret, as the surface of the country is mostly of a loose sand, bearing turfs of wormwood and other plants, rendering the travelling difficult where there is no road. In order to shun the numerous ravines which now began to occur, we chose our route at some distance from the bank of the river, where we found the vallies deeper and more abrupt, though less frequent.

In the coure of our morning's ride of twenty miles, we saw several gangs of wild horses, and with these we distinguished numbers of colts and some mules. In passing through a village of prairie dogs, of which we saw great numbers, Mr. Peale killed a burrowing owl. The bird, though killed instantly, had fallen into one of the marmot's burrows; but had luckily lodged within the reach of the arm. On opening it, the intestines were found filled with the fragments of grasshoppers' wings, and the hard parts of other insects. We have never been able, from examination, to discover any evidence that these owls prey upon the marmots, whose villages they infest.

After proceeding near twenty miles, we directed our course towards the river, which we kept at some distance on our left; arriving at it at two o'clock, we encamped and sent out the hunters; as we had some hopes of procuring a supply of provisions less repugnant to our prejudices than horse-flesh; the hunters, however, as well as others of the party, spent the remaining part of the afternoon in an unavailing search after game.

The hills which bound the immediate valley of the river at this place, have an elevation of from one to two hundred feet above the surface of the water. They are usually covered with a deep sandy soil, but disclose in their sides, points, and precipices of of red sandstone, containing large quantities of very beautiful selenite. The other more common varie-

ties of sulphate of lime are also of frequent occurrence, crystals of carbonate of lime are also met with in veins traversing the sandstone.

The cenchrus tribuloides, a most annoying grass, which is common here, supplies the place of the cactus ferox; and the troublesome stipas of the Platte now become less abundant. The cenchrus bears its seed in small spikelets, which consist of a number of rigid radiating spines. These clusters of barbed thorns are detached at the slightest touch, falling into our mockasins, adhering to our blankets and clothing, and annoying us at every point. The cloth-bur (xanthium strumianum), which had occurred in every part of our route, began now to ripen, and cast off its muricated fruit, adding one more to the sources of constant molestation.

A formidable centipede (scolopendra) was caught near the camp, and brought in alive by one of the engagees. It was about eight inches in length, and nearly three-fourths of an inch in breadth, being of a flattened form, and of a dark brown colour. While kept alive, it showed great viciousness of disposition, biting at every thing which came within its reach. Its bite is said to be venomous.

On the morning of the 8th, we continued our journey, crossing and recrossing the river several times. This we found necessary, as the occurrence of steep and rocky ravines made it impossible to pass along the bank, parallel to the course of the river, which here became more meandering, winding about the points of rocky and impassable promontories.

Few trees occur along this part of the valley; but grape vines were becoming numerous, and some of them loaded with fruit. Among these, we saw numerous signs of the black bear, and one of these animals was this morning seen and shot at, but not killed. We also saw some recent tracks of bison, reviving us with the hope of a return of the days of plenty. We constantly met with the remains of Indian

encampments; trees which had been felled with the tomahawk, and other evidences that the country had been recently occupied by savages.

We passed in the afternoon to a more plain and fertile country than that we had been for some days traversing. The river valley became wide, and bounded on both sides by low and rounded hills instead of abrupt and perpendicular precipices. The interior of the country is but little elevated above the river, and its surface is nearly unbroken.

We crossed the beds of several creeks, apparently of large streams in the wet season, but now entirely destitute of water. As yet we had not a single tributary discharging any water into the river, nor had we been able to discover any augmentation of the volume of water, which appeared to have been derived from tributaries entering on the other side. The channels of all the creeks hitherto observed, were beds of sand without water. Several of these "dry rivers," which we passed in the course of the day, have broad valleys, which, if we may judge from a comparison with that we are descending, must have an extent of more than one hundred miles, draining a wide expanse of country of the surplus water in the rainy season, but remaining dry during great part of the year. At five o'clock we encamped, having travelled twenty-six miles due east. The hunters were immediately sent out, but returned without game, having seen nothing.

A beautiful white-flowered gaura [40], had been for several days observed along the bank of the river. It is undescribed, and has, before flowering, a very distinct resemblance to common flax.

CHAPTER XII.

KASKAIA HUNTING PARTY. — INDIAN ENCAMPMENT. — UNFRIENDLY BEHAVIOUR OF THE KASKAIAS. — SOME ACCOUNT OF THEIR PERSONS AND MANNERS. — SALT PLAINS. — CUMANCIAS.

WEDNESDAY 9th. We breakfasted on the last of the horse, which, having been killed on the 5th, and the weather since unusually warm, had suffered from long keeping. We ate it cheerfully, only regretting that we could not promise ourselves as good for dinner. All our party, who are marksmen, were kept constantly out in search of game, but for several days had met with no success in hunting.

In the morning our course was east, thirteen and a-half miles, at the end of which we found a large spring of transparent and almost pure water, where we halted to dine. Our sufferings from want of provisions, and from the apprehension of still more distressing extremities, were now so great, that we gave little attention to any thing except hunting. Unfortunately for us the wind had been high during the morning, and had blown from west to east, nearly in the direction of our route, so that whatever animals might have been in the way, had received early intimation of our approach. We were glad to observe considerable numbers of wolves, jackals, and carrion birds, as they afforded an almost certain indication of the proximity of herds of bisons. The recent tracks of a herd of these animals had been discovered, from which we learned that they had crossed the river within a day or two, in a crowded and hurried manner, as if pursued by hunters. In the afternoon we pursued on nearly the

same course, and halted for the night at a late hour, much exhausted with fatigue, hunger, and the heat of the day, the mercury at noon having stood at 96°. Distance twenty-eight miles.

At about 10 o'clock on the morning following, the hunters who had preceded the party, discovered on the opposite side of the river a solitary bison, of which they went immediately in pursuit. The party had made their breakfast of about two ounces of sugar and some grapes which had been found near the camp, and having been for several days reduced to a scanty allowance of provisions, they encamped immediately, and awaited with great anxiety the return of the hunters, who soon joined us, bringing in the greater part of the carcass of the bison, so extremely lean and ill-flavoured, that nothing but the most urgent necessity could have induced us to taste it. It was indeed sufficiently evident that the animal was diseased, and had lingered behind the herd for want of strength to travel. Our situation, however, afforded us not the power of choosing, and from the occurrence of this one, we were induced to hope we should soon meet with others in better condition.

We had passed on the preceding day for the first time, a small creek discharging some water into the river, and shortly afterwards the sandy bed of another, sixty yards in width, with an extensive valley, but having no water visible above the sand. This morning we also crossed a tributary affording a little water, and a dry channel communicating opposite to our encampment with the bed of the river, which is filled with small stones, occasioning an inconsiderable fall. Throughout the day the weather was extremely warm, and at sunrise on the following morning, the mercury was standing at 71°.

We had not proceeded far on our way when we discovered on the opposite side of the river a large party of Indians, approaching in an irregular and interrupted line which extended more than a mile from

the opposite bank. They had, as was evident, already discovered us, and their outriders were seen plunging into the river at various points, and several soon came up to shake hands with us. The foremost scarcely allowed themselves time to finish this hasty ceremony of salutation, when they rode to reconnoitre some points of bushes and patches of low grape vines on our left, manifestly to ascertain if the whole strength of our party was collected. The main body of the Indians crossed the river more slowly, and as we halted on an elevation near the point where they ascended the bank, the whole passed in review before us. They were all on horseback, and the squaws and children, composing by far the greatest part of the cavalcade, passed us without halting. Every squaw appeared to have under her care a greater or less number of horses, which were driven before her, some dragging lodge-poles, some loaded with packs of meat, and some carrying children. We were surprised to observe many small children too young to be able by their own strength to sit upon a horse, lashed by their legs to the saddle, and riding on in entire unconcern. As they passed the deepest part of the river, many of the squaws stooped to fill their vessels with water. These were of the most primitive kind, being formed, almost without exception, of the stomach or bladder of a bison or other animal.

At length the chief, who was one of the last to cross the river, came up, and shaking each of us by the hand, with some appearance of cordiality, invited us to accompany him a short distance on his route, to a place where his party would encamp for the remainder of the day and the ensuing night. The chief was accompanied by an old man who could speak a little Spanish, by which language we communicated with him. He informed us his band were a part of the tribe of Kaskaias, or Bad-hearts, as they are called by the French; that they had been on a

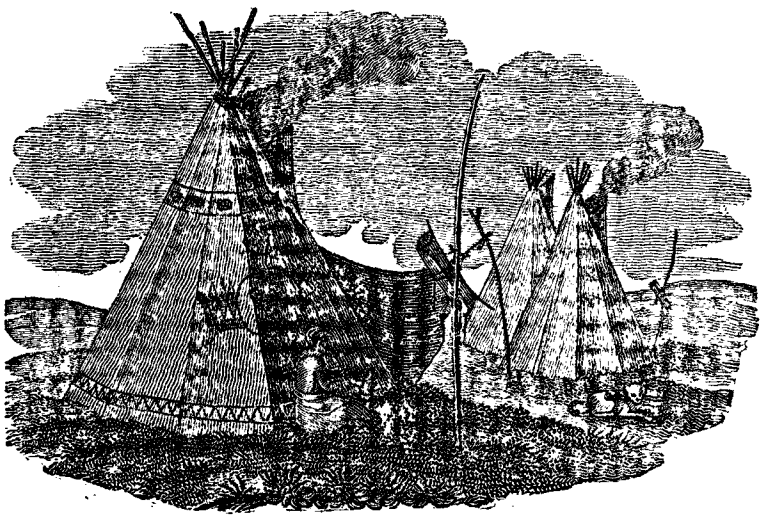
hunting excursion to the sources of the Rio Brases and the Rio Colorado of Texas, and were now on their way to meet the Spanish traders at a point near the sources of the river we were descending. They in their turn demanded who we were, whence and whither we were travelling, and were apparently satisfied with our answers, though, as afterwards appeared, they did not entirely credit what we had told them of the purposes of our journey.

To our inquiries concerning the river they answered without hesitation, that it was Red river; that at the distance of ten days' travelling in the manner of Indians with their lodges, (about one hundred miles,) we should meet with the permanent village of the Pawnee Piquas, that a large band of Cumancias were hunting on the river below, whom we should fall in with in two or three days. Having described to them the route we had pursued, and the great and frequented road on which we had travelled, they said, that when we were at the point where that road first crosses the river, we were three days' ride from Santa Fé, which was situated behind a low and distant range of hills, which we remembered to have seen from that place.

We hesitated a little to comply with the request of the chief, enforced as it was with some insolence, that we would return and encamp with his party. As, however, we wished to purchase horses and provisions, and to make the best use of an opportunity to become acquainted with the savages, we at length consented. The ground they chose for their encampment was a beautiful open plain, having the river in front, and a small creek on the left. We were somewhat surprised to witness the sudden manner in which this plain became covered with their tall conic lodges, rising "like an exhalation" in perfect silence and good order.

For our accommodation, a lodge was spread, enclosing as much space as possible in a semicircular

area in such a manner that the skin covering afforded a shade, which was all the shelter needed. In order to enlarge this tent as much as possible, the covering was raised so high upon the poles, that its lower margin did not extend to the ground by a space of several feet. To remedy this the squaws brought bushes from a neighbouring thicket, which they placed around the base of the lodge in such a manner as effectually to exclude the sunshine. We were sorry to find afterwards, that this had been done not more from motives of hospitality, than to aid them in their design of pilfering from our baggage.



These skin lodges, the only habitations of the wandering savages, are carried with them complete in all their marches. Those of the Kaskaias differ in no respect from those we have already described, as used by the Otoes and others of the Missouri Indians. The poles which are six or eight to each lodge, are from twenty to thirty feet in length, and are

dragged constantly about in all their movements, so that the trace of a party with lodges is easily distinguished from that of a war-party. When they halt to encamp, the women immediately set up these poles; four of them being tied together by the smaller ends, the larger resting on the ground, are placed so far apart as to include as much space as the covering will surround. The remaining poles are added to strengthen the work, and give it a circular form.

The covering is then made fast by one corner to the end of the last pole which is to be raised, by which means it is spread upon the frame with little difficulty. The structure, when completed, is in the form of a sharp cone. At the summit is a small opening for window, chimney, &c. out of which the lodge-poles project some distance, crossing each other at the point where the four shortest are tied together. This tent seems to be sufficient to protect its occupants from the rain; it must however be greatly inferior in point of comfort, particularly in the winter season, to the spacious mud cabins of the settled Indians.

The poles necessary for the construction of these movable dwellings, are not to be found in any part of the country of the Kaskaias, but are purchased from the Indians of the Missouri, or others inhabiting countries more plentifully supplied with timber. We were informed by Bijeau, that five of these poles are, among the Bad-hearts, equal in value to a horse.

The chief of this band is called the Red Mouse. He is of a large stature, is somewhat past the middle age of life, and no way deficient, in his person and countenance, of those indications of strength, cunning, and ferocity, which form so important a part of greatness in the estimation of the Indians. Immediately after he had dismounted from his horse, on the halting of his party, a small wooden dish was brought

him, containing some water. He had received a wound some time before, apparently from an arrow, which had passed through the arm, glancing upon the humerus. Placing the dish on the ground before him, he dipped his hand repeatedly in the water, then seizing a small image of an alligator, profusely ornamented with white and blue beads, he pressed it for some time with all the strength of his disabled arm. This we saw him repeat a great number of times. The alligator appeared to be the "great medicine," on which he relied for the cure of his wound. No dressing or application of any kind was made immediately to the affected part.

As soon as we had placed our baggage in the tent provided for us, we commenced negotiations with Red Mouse, for the purchase of horses. When the articles we proposed to barter were exhibited, he appeared dissatisfied, supposing probably we had still others in reserve, which he would be able by a little obstinacy to extort from us. He accordingly insisted that more of the packs should be opened, and undertook at last to extend his inquiries to our private baggage. This we found it necessary to resist, and a little scuffle ensued, at which many of the Indians, with a throng of women and children who surrounded us, took fright and ran off with the utmost despatch. They appeared all somewhat surprised and intimidated, and the few who remained in our lodge entreated us not to be angry at the insolence they had shown, saying we should frighten their women, and that they had mistaken us for traders. We had good reasons for wishing not to carry our resentment farther than was necessary, and accordingly relinquished the attempt to trade with them; informing them at the same time that we were hungry. Having received us in a friendly manner, we expected they would, according to custom of most Indians, have shown their good-will, by inviting us to a feast. We had,

therefore, waited with some impatience for their good cheer so long, that hope began to fail us. It will be recollected, we had for some days been almost in a starving condition; and we perceived that the Indians had very plentiful supplies of jerked meat. In compliance with our repeated requests, the wife of the Red Mouse at length brought us a little half-boiled bison meat, from which we had observed her her to select the best pieces and give them to the children. After we had eaten this, we returned the wooden dish, on which it had been brought, at the same time asking her for more. This second demand procured us a little more jerked meat, which came, however, with such an ill grace, that as our hunger was somewhat appeased, we resolved to ask them for no more.

Some one of the party having asked for water, the paunch of a bison was brought, containing three or four quarts, from which we all managed, though with some difficulty, to drink. Little care or labour had been bestowed on the preparation of this primitive vessel. The papillous coat which formed the internal surface of the stomach of the animal, had not been removed, nor had it lost, from long use, its original smell. The organ is suffered to retain its original form as far as is consistent with the uses to which it is applied. One of the orifices is brought nearly in contact with the other, where it is retained by a stick passed through the margin; the depending part is a sack sometimes large enough to contain six or eight gallons of water. It may well be supposed practice is required to enable a person to drink with ease and adroitness from one of these vessels; and the Indians appeared somewhat amused at our awkward attempts, in which we spilt more water in our bosoms, than was conveyed into our mouths.

When filled, these sacks cannot be set upon the ground without suffering the loss of their contents. To remedy this, the Kaskaias carry with them, as an

indispensable article of furniture, a sort of tripod, consisting of three light poles, tied together at one end, and sharpened at the other, by which they are driven into the ground, and the water-sack is suspended between them. One of these was placed near the entrance of almost every lodge in this encampment.

We had scarcely finished our scanty repast, when the wife of the Red Mouse showing her trencher, to signify that we were her debtors, began to beset us for presents; as we were, however, little pleased with her hospitality, we treated her demands much as she had done ours. A number of small articles were pilfered from us, and the Indians seemed determined to show us little respect, until they perceived we were putting our guns in order for immediate use; at this they expressed some apprehension, and behaved afterwards with less rudeness.

There were thirty-two lodges, and probably about two hundred and fifty souls, including men, women, and children. Among them we could number only twenty-two armed men; and these kept constantly about us. They were armed exclusively with bows and arrows, and, as we believed, had some fear of us, though we were less than half their number. It was probably owing to our perceiving, or at least appearing to perceive this, that we escaped from them uninjured. They had many horses, probably more than five hundred, and some of them very good.

Towards evening the chief withdrew from our lodge, when we observed his squaw prepare some food for him, pounding the jerked meat to a powder with a stone pestle, using a piece of skin instead of a mortar. When reduced to very fine fragments, it is mixed with bison tallow; a little water is added, and the whole boiled together. After he had finished his meal, a council was held between all the men of the band. They met behind the chief's lodge, and we were not greatly pleased to perceive, that they

seemed anxious to conceal their meeting from us. At night we determined to collect all our horses, and, placing them as near as we could around our lodge, to watch them during the night; but, upon examination, a few of them only could be found, the remainder, as we believed, having been seized by the Indians. The crowd which had been assembled about us during the day, dispersed as the evening advanced, and at dark all became still in and about the encampment. At this time the chief, whose lodge was near ours, standing at the entrance of his dwelling, harangued with great vehemence, in a voice sufficiently loud and clear to be heard by all his people, who had now retired to their several lodges. As we had no interpreter of their language, we could understand nothing of the import of his speech. Every thing remained quiet during the night, and as soon as the day dawned on the following morning, a loud harangue, similar to that in the evening, was pronounced by the chief, and immediately afterwards the whole camp was in motion. The lodges were taken down, the packs placed upon the horses, and the whole body were in a short time ready to move off. As several of our horses, our kettles, and other articles of the greatest importance to us were missing, we were unwilling to part from our hosts in the hasty and unceremonious manner they seemed to intend. We accordingly summoned the old Indian interpreter, and made our complaint and remonstrance to the chief. He told us our horses had strayed from camp, and that several of his people were then out searching for them, and made other excuses, evidently designed to gain time until his band could move off. Perceiving we had no time to lose, Major Long ordered horses and other articles, corresponding to those we had lost, to be immediately seized. This prompt and well-timed measure produced the desired effect. Their whole camp had been some time in motion; the women

and children, with all their baggage, except what we had detained, had moved to a considerable distance; and we found ourselves, at this unpleasant state of the dispute, surrounded by their whole armed force. We observed they had a greater number of arrows in their hands than on the preceding day, and were not without our fears, that they intended to carry the dispute respecting our horses and kettles to greater lengths than we could wish. We were, however, agreeably disappointed, to learn that all our lost property had been found. It was accordingly restored to us, and we parted from the Kaskaias as friends.

The time we spent with this band of savages was so short as to afford little opportunity of becoming acquainted with their manners. Their dress is nearly similar to that of the Pawnees, but consists more exclusively of leather. The women, instead of the robe, wear a loose sort of a frock without sleeves. It has an opening for the neck, just large enough to admit the head, and descends from the shoulders, hanging like a bag about the body, and reaching below the knees. When eagerly engaged in their employments, this inconvenient article of dress is thrown aside, and there remains the squabbish person of the female savage, disfigured only by a small apron of leather worn round the waist. The young females appear to be in some measure exempted from the laborious services performed by the married women, and consequently possess a degree of lightness and elasticity in their persons, which they soon lose after they begin to bear children, and subject themselves to the severe drudgeries of a married life. Their breasts become so flaccid and pendulous, that we have seen them give suck to their children, the mother and the child at the same time standing erect upon the ground. This fact is sufficient to prove that they do not, at least in some instances, wean their children at a very early age.

Like all savages, they suffer themselves to be covered with filth and vermin, notwithstanding which some of the young ones are far from disgusting in their appearance. They have well turned features, aquiline noses, large and regular teeth, and eyes, which though usually rather small, are clear and brilliant. Some of the men of this band have larger and finer teeth than we remember to have seen heretofore among savages. In the general structure of their features, and the complexion of their skins, they resemble the Missouri tribes, being of a clearer and brighter red than many of the eastern Indians. In stature and in symmetry, and elegance of form, they are inferior to the Otoes, Pawnees, and to most of the Missouri Indians who reside in permanent villages. They seemed to have had little intercourse with the whites, as some among them appeared to take great pleasure in exhibiting to their friends the skin of our arms, which they requested us to show for that purpose. It was probably by means of a mistake on the part of one of the interpreters, that we received the intimation that they had never heard before of such a people as that to which we belonged. We saw among them few articles of foreign production; these they had probably received from Spanish traders. In the whole encampment we saw but one kettle, which belonged to the chief, and their great eagerness to steal our tin cups and other similar articles, sufficiently evinced that such things are scarce, and of great value among them. They have some beads, most of which are bestowed in ornamenting the dress of the children; also some pewter and brass rings, worn principally by the women. They are acquainted with the use of tobacco, and smoked with us according to the universal custom of the Indians, but expressed by signs that they found the smoke of unmixed tobacco too strong for them. One of their young men, who was in his ordinary dress when we met the party, visited us soon after we had encamped,

dressed in leggings and breech cloth, with a striped worsted vest and a silver-headed bamboo, which he sported among us with the air of a great traveller.

A child was shown us who spoke Spanish, and who was said to be a prisoner from the Spanish settlements; he was not, however, distinguished from the Kaskaias by any difference of colour or of features. He spoke frequently of the Christians, which convinced us that he had at least been among the half civilized Indians of New Mexico, who have some acquaintance with the Spanish language, and have been taught enough of the Christian religion to make use of the sign of the cross.

This band of Kaskaias occupy the country about the sources of the Platte, Arkansa, and Rio Del Norte, and extend their hunting excursions to Red river and the sources of the Brases. The great numbers of images of the alligator, which they wear either as ornaments or as amulets for the cure or prevention of disease and misfortune, afford sufficient proof of their extending their rambles to districts inhabited by that reptile. These images are of carved wood covered with leather, and profusely ornamented with beads. They are suspended about the neck, and we saw several worn in this manner by the children as well as by adults. It was observed likewise, that the rude frames to the looking-glasses, carried by several of the men, were carved so as to approximate towards the same form.

It is perhaps owing to their frequent exposures to the stormy and variable atmosphere of the country about the Rocky Mountains, that these Indians are subjected to numerous attacks of rheumatic and scrofulous diseases. We saw one old woman with a distorted spine, who had probably suffered, when young, from rickets. A young man, of a fine athletic frame, had his neck covered with scrofulous ulcers. While he was with us he was constantly endeavouring to conceal with his robe this afflicting spectacle. He

remained but a short time among us, and did not make his second appearance.

An old man came frequently with a diseased leg, informing us by signs, that it had repeatedly formed large abcesses, which had discharged much matter, and afterwards healed. His frequent applications seemed to be made with the hope that we would do something for his relief. The men of this band wear the hair long, and suffer it to hang negligently about the shoulders. Some of them have a braid behind, which is garnished with bits of red cloth, small pieces of tin, &c. and descends nearly to the ground, being sometimes eked out with the hair of a horse's tail. Among the old men were several who had suffered a number of scattering hairs on the face to become of considerable length, a violation of good manners, and a neglect of personal neatness, not often met with among the Indians, and excusable only in the old. In their conduct towards us, they were guilty of more rudeness and incivility than we had been accustomed to meet with among the savages of the Missouri. Soon after we had encamped with them, one of our party who had brought along a roasted rib of a bison which had remained of our breakfast, had produced this bone, and was engaged in eating from it; an Indian who observed this came up, and without ceremony taking the rib out of his hand, carefully scraped off and ate all the meat, and returned the bone.

Though we saw much to admire among this people, we cannot but think they are among some of the most degraded and miserable of the uncivilized Indians on this side of the Rocky Mountains. Their wandering and precarious manner of life, as well as the inhospitable character of the country they inhabit, precludes the possibility of advancement from the profoundest barbarism. As is common among other of the western tribes, they were persevering in offering us their women, but this appeared to be

done from mere beastliness and the hope of reward, rather than from any motive of hospitality or a desire to show us respect. We saw among them no article of food except the flesh of the bison; their horses, their arms, lodges, and dogs, are their only wealth.

In their marches they are all on horseback; the men are expert horsemen, and evince great dexterity in throwing the rope, taking in this way many of the wild horses which inhabit some parts of their country. They hunt the bison on horseback with the bow and arrow, being little acquainted with fire arms. One of them who had received a valuable pistol from a member of our party, soon afterwards returned, and wished to barter it for a knife. They begged for tobacco, but did not inquire for whiskey; it is probable they have not yet acquired a relish for intoxicating liquors. In their persons they are all uncommonly filthy, and many of the women spent a great part of their time in catching and eating the lice from the heads of their children.

At eight o'clock on the morning of the 12th of August we took our leave of the Kaskaias, having recovered from them all the articles they had stolen, except a few ropes, halters, and other small affairs, which not being indispensably necessary to us, we chose to relinquish, rather than submit to a longer delay among a people we had so much reason to dislike.

They had shown a disposition so far from friendly towards us, that we were surprised to have escaped without having found it necessary to use our rifles among them; and as we thought it by no means improbable some of their young men might follow us to steal our horses, we moved on rather briskly, intending to travel as far in the course of the day as we conveniently could.

The river valley spread considerably a little below the point where we had encamped. In many places we found the surface a smooth and naked bed of

sand; in others, covered by an incrustation of salt, like a thin ice, and manifestly derived from the evaporation of water which had flowed down from the red sandstone hills bounding the valley. These hills were here of moderate elevation, the side towards the river being usually abrupt and naked. The sandstone is fine, of a deep red colour, indistinctly stratified and traversed in various directions by veins filled principally with sulphate of lime.

We had seen among the Indians on the preceding day quantities of salt in large but detached crystalline fragments, greatly resembling the common coarse salt of commerce. It had evidently been collected from some place like the one above mentioned, where it had been deposited from solution in water. When we inquired the particular locality of the Indians, they pointed to the south, and said it was found near the sources of a river heading in that direction.

At the place of our evening encampment, we saw the red-necked avoset (recurvirostra americana), the minute tern (sterna minuta), and several other strand birds which we could not approach near enough to distinguish the species. There is also a very evident similarity between the plants found here and many of those growing in saline soils along the sea coast. We saw here several species of atriplex, chenopodium, salsola, kochia, and anabasis, all delighting in a saline soil, and affording on analysis a greater proportion of soda than most inland plants.

The day had been unusually warm. During all our mid-day halt, protracted, on account of the sultriness of the weather, to an unusual length, the mercury had remained at 100°, the thermometer being suspended in the closest shade we could find. It is to be remarked, however, that in almost every one of the numerous instances when the mercurial column had indicated so high a temperature as in

the one just mentioned, a fair exposure could not be had.

We often found it necessary to halt upon the open plain, where the intensity of light and heat were much increased by the reflection of the sun's rays from the sand. The temperature indicated by the thermometer, suspended in the imperfect shade of our tent, or of a small tree, was however somewhat lower than that to which our bodies were exposed; and it will be believed our sufferings from this source were great, both on our marches and while encamped in the middle of the day. Our tent being too small to afford its imperfect shade to the whole party, we sometimes suspended blankets, using, instead of poles, our rifles and gunstocks, but the protection these could afford against the scorching glare of a vertical sun, was found extremely inadequate.

At sunset we crossed what appears to be at some seasons of the year the bed of a large river at least two hundred yards wide, but at this time not a drop of water was found in it. It has a wide valley, and in every respect but the occasional want of water, is a large stream. A little beyond this we encamped for the night, having travelled twenty-eight miles.

August 13th. The course of the river had now become considerably serpentine, so that our route along its valley was of necessity somewhat circuitous. Wishing to avoid the unnecessary travelling thus occasioned, we turned off from the river and ascended the hills, hoping to meet with an Indian trace leading across the country by the most direct route. Our search was however unavailing, only affording us an opportunity of examining a portion of the country remote from the river. This we found much broken with irregular hills, abrupt ravines, and deep valleys. At ten o'clock we met with a small stream of water running towards the river we had left, and crossing it, perceived the trace of a large party of mounted Indians which had ascended

the creek within a few hours previous. We supposed they must have been the band of Cumancias spoken of by the Bad-hearts; and, notwithstanding some fears we have had reason to entertain, that they would have treated us no better than the Kaskaias had done, we considered ourselves unfortunate in not having met them. Much confusion and uncertainty attends the limited information hitherto before the public concerning the wandering bands of savages who occupy the country between the frontiers of New Mexico and the United States. Some who have spoken of these Indians, seem to have included several of the erratic hordes already enumerated under the name of Hietans or Cumancias. From their wandering mode of life, it unavoidably happens that the same band is met by hunters and travellers in different parts of the country at different times, consequently they receive different appellations, and the estimate of their numbers becomes much exaggerated. Of this band we have no other information to communicate, than that they appeared, from the tracks of their horses and lodge-poles, to have been rather more numerous than the party of Bad-hearts we had lately met. A recent grave was discovered by one of our hunters at no great distance from the river, in which it was supposed one of this band had been buried. At one end of the grave was erected a pole about ten feet in length, crossed near the top by another two feet along. To the foot of this rude cross was tied a pair of mockasins, newly soled and carefully prepared for the use of the departed in that long journey on the *road of the dead* to which the good wishes of some friend had accompanied him.

Where we halted at noon were some trees, and several of these were covered with grape vines, loaded with ripe and delicious fruit. The Osage plum was also common, and now beginning to ripen. The temperature of the air inside of our tent, partially shaded by some small trees, was sufficiently

high to keep the mercury at 105° Fah. from twelve o'clock to three P. M. A suffocating stillness prevailed in the air, and we could find no relief from the painful glare of light and the intense heat which seemed about to reduce the scanty vegetation to ashes.

In the afternoon a thick grove of timber was descried at a distance below, and on the opposite side of the river. This cheering sight was like the discovery of land to the mariner, reminding us of the comparative comfort and plenty which we had learned to consider inseparable from a forest country, and exciting in us the hope that we should soon exchange our desolate and scorching sands for a more hospitable and more favoured region. As this little grove of trees, appearing to us like the commencement of an immense forest, gave us reason to expect we should soon meet with some small game at least; Mr. Peale, with one man, went forward to hunt. Soon after arriving at the wood, they discovered a flock of turkeys, and the rifleman dismounting to shoot, left his mule for a moment at liberty. The animal, taking a sudden advantage of the opportunity, turned about, and made the best of his way out of the wood, pursued by Mr. Peale. This chase continued about five miles, and ended in putting the mule on the recent trace of the party, which there was no reason to fear he could be induced to quit, until he had rejoined his companions. Mr. P., who was exhausted with the pursuit, followed on but slowly, and neglecting to follow carefully the path of the party, he passed us, after we had turned aside to encamp, still travelling on in the direction of our course. At dark, believing we were still before him, and knowing we must encamp near the river, he betook himself to the sand-bars, which were now naked, occupying the greater part of what was sometimes the bed of the stream. Along these he travelled, occasionally discharging a pistol, and looking

about in constant expectation of seeing the blaze of our evening fire, until the moon began to sink behind the hills, when finding the light insufficient to enable him to continue his search, he tied his horse to a tree, and laid down to await the return of daylight.

At camp, guns were discharged, as large a fire kindled as we could find the means of making, and other measures taken to give notice of our situation; and late in the evening, the man whose mule had been the occasion of the accident, joined us, but was unable to give any account of Mr. Peale or the mule, which had, however, arrived before him.

At seven o'clock on the morning following, Aug. 14th, Mr. P. returned to us, having convinced himself, by a careful examination of the river valley, that we were still above. He accordingly retraced his course, until he discovered the smoke of our encampment. He had been much harassed in the night by mosquitos; and bisons having recently occupied the shade of the tree under which he slept, the place afforded as little refreshment for the horse as for himself. Delaying a little to allow him time to make amends for his long absence, we left our camp at a later hour than usual; and moving along a wide and somewhat grassy plain, halted to dine near an old Indian breast-work by the side of a grove of cotton-wood trees, intermixed with a few small-leaved elms. This breast-work is built like that described on the Platte, a few days' march above the Pawnees. We have met with the remains of similar works in almost every grove of trees, about the base of the mountains; near some of them, we have noticed holes dug a few feet into the ground, probably as caches or depositories of provisions; the earth which was raised having been removed to a distance, or thrown into the river, that it might not lead to the discovery of the concealed articles. We have met with large excavations of this kind, having an entrance comparatively small, and so placed as to be

easily concealed; made by white hunters to hold their furs, and whatever else they might wish to deposit in safe keeping.

The occurrence of the elm, the phytolacca, the cephalanthus, and other plants not to be met with in a desert of sand, give us the pleasing assurance of a change we have long been expecting to see in the aspect of the country. The blue jay, the purple martin, a deer, and some turkeys, were also seen near this encampment.

The bed of the river is here eight hundred yards wide, but the quantity of water visible is much less than in some places above. The magnetic variation ascertained at this camp was 12° 30′ east.

CHAPTER XIII.

SAND PLAINS. — MISSISSIPPI HAWK. — SMALL-LEAVED ELM. — WILD HORSES. — HAIL-STORM. — CLIMATE. — BISONS. — GRAPES. — RED SAND FORMATION. — GYPSUM.

AUGUST 15th. Extensive tracts of loose sand, so destitute of plants, and so fine as to be driven with the wind, occur in every part of the saline sandstone formation we had as yet seen. They are perhaps invariably the detritus of the sand-rock, deposited in valleys and depressions, where the rapidity of the abrading currents has been checked by permanent obstacles. This loose sand differs in colour from the sandstone, which is almost invariably red; the difference may, however, have been produced simply by the operation of water suspending and removing the light colouring matter, no longer retained by the aggregation of the sandstone. These fields of sand have most frequently an undulating surface, occasioned probably not less by the operation of winds than by the currents of water; a few plum bushes, almost the only woody plants found on them, wherever they take root, form points, about which the sand accumulates, and in this manner permanent elevations are produced. The yucca angustifolia and the shrubby cactus are here rarely seen; the argemone and the night-flowering bartonia have not entirely disappeared, but are not of frequent occurrence.

Our horses had broken loose, and a part of them strayed from camp. This occasioned some unusual delay, and the morning was somewhat advanced when we commenced our ride. The day was bright and cool, comparatively so at least, the mercury in

the extreme heat rising to only 95° in the shade of our tent, whereas on several of the preceding days, it had stood at or above 100° in a fairer exposure. A light breeze sprung up from the south-west, and continued during the remainder of the day. Our course led us twice across the bed of the river, which we found one thousand and four hundred paces in width; and without water, except in a few small pools, where it was stagnant. This wide and shallow bed is included between low banks, sometimes sloped gradually, and sometimes, though rarely, perpendicular, and rising scarcely more than four feet from the common level of the bottom of the channel. Drift wood is occasionally seen without these banks, affording evidence that they are at times not only full, but overflowed. If they are ever but partially filled, it is easy to see that what, for a great part of the year, is a naked sand beach, then becomes a broad and majestic river. It must flow with a rapid current, and in floods; its waters cannot be otherwise than of an intense red colour. The immediate valley of the river had now become little less than two miles in width; and had, in some places, a fertile soil. This happens wherever there occur spots having little elevation above the bed of the river, and which have not recently been covered with sand.

Several species of locust were extremely frequent here, filling the air by day with their shrill and deafening cries, and feeding with their bodies great numbers of that beautiful species of hawk, the falco Mississipiensis of Wilson. It afforded us a constant amusement to watch the motions of this greedy devourer in the pursuit of his favourite prey, the locust. The insect being large, and not uncommonly active, is easily taken; the hawk then pauses on the wing, suspending himself in the air, while, with his talons and beak, he tears in pieces and devours his prey.

We were also fortunate in capturing a tortoise,

resembling the T. geographica of Le Sueur. The upper part of its shell was large enough to contain near a quart of water, and was taken to supply the place of one of our tin cups recently lost, while the animal itself was committed to the mess-kettle. Wolves, jackals, and vultures, occurred in unusual numbers, and the carcasses of several bisons recently killed had been seen. We could also distinguish the recent marks of a hunting party of Indians, the tracks of horses and of men being still fresh in the sand. At four P. M., several bisons were discovered at a distance, and as we were in the greatest want of provisions, we halted, and sent the hunters in pursuit; and being soon apprized of their success, the requisite preparations were made for jerking the meat. Near our camp was a scattering grove of small-leaved elms. This tree (the U. alata, N.) is not known in the Eastern states; but it is common in many parts of Tennessee, Missouri, and arkansa. When found in forests intermixed with other trees, it is usually of a smaller size than the ulmus americana, and is distinguished from it by the smallness of the leaves and the whiteness of the trunk. On the borders of the open country, where large trees often occur entirely isolated, the ulmus alata has proportionally a more dense and flattened top than any other tree we have seen. When standing entirely alone, it rarely attains an elevation of more than thirty or thirty-five feet; but its top lying close to the ground, is spread over an area of sixty or seventy feet in diameter, and is externally so close and smooth as to resemble, when seen from a distance, a small grassy hillock.

Near our camp was a circular breast-work, constructed like those already mentioned, and large enough to contain eighty or an hundred men. We were not particularly pleased at meeting these works so frequently as we had done of late, as they indicate the country where they are found, to be one

particularly exposed to the depredations of Indian war-parties.

August 16. The greater part of the flesh of the bison killed on the preceding evening had been dried and smoked in the course of the night, so that we had now no fear of suffering immediately from hunger, having as much jerked meat as was sufficient to last several days.

The sky continued clear, but the wind was high, and the drifting of the sand occasioned much annoyance. The heat of the atmosphere became more intolerable, on account of the showers of burning sand, driven against us with such force as to penetrate every part of our dress, and proving so afflictive to our eyes, that it was with the utmost difficulty we could see to guide our horses. The sand is carried from the bed of the river, which is here a naked beach of more than half a mile wide, and piled in immense drifts along the bank. Some of these heaps we have seen covering all but a small portion of the upper branches of what appeared like large trees. Notwithstanding we were now three hundred miles distant from the sources of the river, we found very little water; and that being stagnant, and so much frequented by bisons and other animals, was so loathsome both to sight and smell, that nothing but the most uncontrollable thirst could have induced us to taste it.

At a short distance below the place of our encampment, we passed the confluence of a considerable creek entering from the south-west. Though like all the streams of this thirsty region, its waters were entirely hid in the sand; yet it is evidently the bed of a large tributary, and from its direction, we conclude it can be no other than the one on which the Kaskaias informed us they had encamped the night before we met them. Its name, if it have any, among the Indians or Spaniards, we have not yet learned.

We had, for some days, observed a few wild horses,

and they, as well as the bisons, were now becoming numerous. In the habits of the wild horse, we find little unlike what is seen in the domestic animal, though he becomes the most timorous and watchful of the inhabitants of the wilderness. They show a similar attachment to each other's society, though the males are occasionally found at a distance from the herds. It would appear, from the paths we have seen, that they sometimes perform long journeys, and it may be worthy of remark, that along these paths are frequently found very large piles of horse-dung, of different ages, affording sufficient evidence that this animal, in a wild state, has, in common with some others, an inclination to drop his excrement where another has done so before him. This propensity is sometimes faintly discovered in the domestic horse.

As we were about to halt for dinner, a bison who had lingered near our path was killed; but the flesh was found in too ill a condition to be eaten, as is the case with all the bulls at this season.

Soon after we had mounted our horses in the afternoon, a violent thunder-storm came on from the north-west; hail fell in such quantities, as to cover the surface of the ground, and some of the hail-stones which we examined, were near an inch in diameter. Falling with a strong wind, these heavy masses struck upon our bodies with great violence; our horses, as they had done on a similar occasion before, refused to move, except before the wind. Some of the mules turned off from our course, and had run more than half a mile before they could be overtaken. For ourselves, we found some protection, by wrapping our blankets loosely around our bodies, and waited for the cessation of the storm, not without calling to mind some instances on record of hail-stones which have destroyed the lives of men and animals.

It is not improbable, that a climate of a portion of country within the range of the immediate influence

of the Rocky Mountains, may be more subject to hail-storms in summer, than any other parts of North America in the same latitude. The radiation of heat from so extensive a surface of naked sand, lying along the base of this vast range of snowy mountains, must produce great local inequalities of temperature. The diminished pressure of the atmosphere, and the consequent rapidity of evaporation, in these elevated regions, may also be supposed to have an important influence on the weather. We have not spent sufficient time in the country, near the eastern range of the Rocky Mountains, to enable us to speak with confidence of the character of its climate. It is, however, sufficiently manifest, that in summer it must be extremely variable, as we have found it; the thermometer often indicating an increase of near fifty degrees of temperature between sunrise and the middle of the day. These rapid alternations of heat and cold must be supposed to mark a climate little favourable to health, though we may safely assert that this portion of the country is exempt from the operation of those causes which produce so deleterious an atmosphere in the lower and more fertile portions of the Mississipi basin. If the wide plains of the Platte, the Upper Arkansa, and the Red river of Louisiana should ever become the seat of a permanent civilized population, the diseases most incident to such a population will probably be fevers, attended with pulmonary and pleuritic inflammations, rheumatism, scrofula, and consumption. It is true, that few, if any, instances of pulmonary consumption occur among the Indians of this region; the same remark is probably as true of the original native population of New York and New England.

Though much rain fell during this storm, it was so rapidly absorbed by the soil, that but little running water was to be seen. The bed of the river was found smooth and unobstructed, and afforded us for several days the most convenient path for travelling. As we

descended, we found it expand in some places to a width of near two miles. Bisons became astonishingly numerous; and in the middle of the day countless thousands of them were seen coming in from every quarter to the stagnant pools which filled the most depressed places in the channel of the river. The water of these was of course too filthy to be used in cooking our meat, and though sometimes compelled to drink it, we found little alleviation to our thirst. At our encampments, we were able to supply ourselves with water of a better quality by digging in the sand, where we scarce ever failed to meet with a supply at a few feet from the surface.

On the 17th, we halted in the middle of the day to hunt, as, although we had killed several bisons on our marches of the preceding days, none of them had been found in good condition. The flesh of the bulls, in the months of August and September, is poor and ill flavoured; but these are much more easily killed than the cows, being less vigilant, and sometimes suffering themselves to be overtaken by the hunter, without attempting to escape. As the herds of cows were now seen in great numbers, we halted, while the hunters went out and killed several. Our camp was placed on the south-west side of the river, under a low bluff, which separates the half-wooded valley from the open and elevated plains. The small elms along this valley were bending under the weight of innumerable grape vines, now loaded with ripe fruit, the purple clusters crowded in such profusion as almost to give a colouring to the landscape. On the opposite side of the river was a range of low sand hills, fringed with vines, rising not more than a foot or eighteen inches from the surface. On examination, we found these hillocks had been produced exclusively by the agency of the grape vines, arresting the sand as it was borne along by the wind, until such quantities had been accumulated as to bury every part of the plant, except the end of the branches. Many of these were so loaded with

fruit, as to present nothing to the eye but a series of clusters, so closely arranged as to conceal every part of the stem. The fruit of these vines is incomparably finer than that of any other native or exotic which we have met with in the United States. The burying of the greater part of the trunk, with its larger branches, produces the effect of pruning, inasmuch as it prevents the unfolding of leaves and flowers on the parts below the surface, while the protruded ends of the branches enjoy an increased degree of light and heat from the reflection of the sand. It is owing, undoubtedly, to these causes, that the grapes in question are so far superior to the fruit of same vine in ordinary circumstances. The treatment here employed by nature, to bring to perfection the fruit of the vine may be imitated; but without the same peculiarities of soil and exposure, can with difficulty be carried to the same magnificent extent. Here are hundreds of acres, covered with a movable surface of sand, and abounding in vines, which, left to the agency of the sun and the winds, are, by their operation, placed in more favourable circumstances than it is in the power of man, to so great an extent, to afford. We indulged ourselves to excess, if excess could be committed in the use of such delicious and salutary fruit, and invited by the cleanness of the sand, and a refreshing shade, we threw ourselves down, and slept away, with unusual zest, a few of the hours of a summer afternoon.

Our hunters had been as successful as could be wished, and at evening we assembled around a full feast of "marrow-bones;" a treat whose value must for ever remain unknown to those who have not tried the adventurous life of the hunter. We were often surprised to witness in ourselves a proof of the facility with which a part at least of the habits of the savage could be adopted. Having been in several instances compelled to practise a tedious abstinence, the return of plenty found us well disposed to make amends for these temporary privations; and we lin-

gered, almost involuntarily, at every meal, as if determined not only to supply the deficiency of the past, but to secure such ample supplies as would enable us to defy the future.

The grapes and plums, so abundant in this portion of the country, are eaten by turkies and black bears, and the plums by wolves or jackals, as we conclude, from observing plumstones in the excrement of one of those animals. It is difficult to conceive whence such numbers of predatory animals and birds, as exist in every part of the country where the bisons are present, can derive sufficient supplies for the sustenance of life; and it is indeed sufficiently evident, their existence is but a protraction of the sufferings of famine.

The great flowering hibiscus is here a conspicuous and highly ornamental plant among the scattering trees in the low grounds. The occurrence of the black walnut, for the first time since we left the Missouri, indicates a soil somewhat adapted to the purposes of agriculture. Portions of the river valley, which are not covered with loose sands, have a red soil, resulting from the disintegration of the prevailing rocks (red sandstone and gypsum) intermixed with clay, and are covered with a dense growth of fine and nutritious grasses. Extensive tracts of the great woodless plain, at a distance from the river, appear to be based upon a more compact variety of sandstone, which is usually of a dark gray colour, and less pervious to water than the red. For this reason some copious springs are found upon it, and a soil by no means destitute of fertility, yielding sustenance to inconceivable numbers of herbivorous animals, and through them to innumerable birds and beasts of prey. It must be supposed, however, that the herds of bisons daily seen about the river, range over a much greater extent of country than was comprised within our limited views. The want of water in many places may compel them to resort

frequently to the river in dry weather; though at other times they may be dispersed in the high plains.

August 18th. In speaking of a country whose geography is so little known as that of the region S. W. of the Arkansa, we feel very sensibly the want of ascertained and fixed points of reference. Were we to designate the locality of a mineral, or any other interesting object, as found twenty or thirty days' journey from the Rocky Mountains, we should do nearly all in our power; yet this sort of information would probably be thought vague and useless. The smaller rivers of this region have as yet received no names from white hunters; if they have names among the Indians, these are unknown to us. There are no mountains, hills, or other remarkable objects to serve as points of departure, nearer than the Rocky Mountains and the Arkansa. The river itself, which we supposed to be the Red river of Natchitoches, is a permanent landmark; but it is a line and not a point; and aids us only in one direction, in our attempts to designate locality. The map accompanying this work was projected in conformity to the results of numerous astronomical observations for latitude and longitude; but many of these observations were made at places which are not, and at present cannot be known by any names we might attempt to fix upon them. More extensive and minute examination than we have been able to bestow might establish something like a sectional division, founded on the distribution of certain remarkable plants. The great cylindric cactus, the ligneous rooted cucumis, the small-leaved elm, might be used in such an attempt; but it is easy to see that the advantages resulting from it, would be for the most part imaginary.

Discussions of this sort have been much insisted on of late, and may be important as aiding in the geography of climates and soils, but can afford little assistance to topography.

The geognostic features of the region under consideration, afford some foundation for a natural division, but this division must be so extremely general as to afford little satisfaction. We could only distinguish the red sandstone, the argillaceous sandstone, and the trap districts, and though each of these have distinctive characters not easy to be mistaken, they are so irregular in form and position, as to be in no degree adapted to aid in the description and identifying of particular places. On the contrary, it is to be regretted there are no established points to which we might refer, in communicating what we have observed of the position of these formations, and indicating the particular localities of some of the valuable minerals they contain.

The red sandstone, apparently the most extensive of the rocky formations of this region, has, wherever it occurs, indications of the presence of muriate of soda, and almost as commonly discloses veins and beds of sulphate of lime. The substance last mentioned had been growing more and more abundant since we left the region of the trap rocks at the sources of the river. It was now so frequent as to be conspicuous in all the exposed portions of the sand-rock, and was often seen from a distance of several miles. It occurs under various forms, sometimes we meet with the most beautiful selenite, disposed in broad reticulating veins, traversing the sandstone; the granular and fibrous varieties, whose snowy whiteness contrasts strongly with the deep red and brown of the sandstone, are sometimes seen in thin horizontal lamina, or scattered about the surface, somtimes included in larger masses of the common amorphous plaister-stone. This last is usually of a colour approaching to white, but the exposed surfaces are more or less tinged with the colouring matter of the sand-rock, and all the varieties are so soft as to disintegrate rapidly when exposed to the air. Recent surfaces show no ferruginous tinge;

or rather, we would say, this colour does not appear to have been contemporaneous to the formation of the sulphate of lime, but derived from the cement of the sandstone, and to have penetrated no farther than it has been carried by the impetration of water.

We left our encampment at 5 o'clock, the morning fair; thermometer at 62°. Our courses regulated entirely by the direction of the river, were north fifty-five east, eleven miles; then north, ten east, seven miles; in all eighteen miles before dinner. * The average direction of our courses for some days had been rather to the north, than south of east. This did not coincide entirely with our previous ideas of the direction of Red river, and much less of the Faux Ouachitta, or False Washita, which which being the largest of the upper branches of the Red river from the north, we believed, might be the stream we were descending. From observations taken at several points along the river we had ascertained, that we must travel three or four days' journey to the south, in order to arrive at the parallel of the confluence of the Kiamesha with the Red river †, and we were constantly expecting a change in the direction of our courses. The confident assurance of the Kaskaias, that we were on the Red river, and but a few days march above the village of the Pawnee Piquas, tended to quiet the suspicions we began to feel on this subject. We had now travelled, since meeting the Indians, a greater distance than we could suppose they had intended to indicate by the admeasurement of ten "lodge days," but we were conscious our communications with them had been made through inadequate interpreters, and it was not without reason, we began to fear we might have received erroneous impressions. In the afternoon, however, the river inclined more

* The magnetic variation was here from 12° to 13° east.

† The latitude of this point was ascertained by Major Long, in December, 1819, to be a few minutes below 34° north.

to the direction we wished to travel, and we had several courses to the south of east. At sunset we pitched our tent on the north side of the river, and dug a well in the sand, which afforded a sufficient supply of wholesome, though brackish, water. Throughout the night the roaring of immense herds of bisons, and the solemn notes of the hooting owl were heard, intermixed with the desolate cries of the jackal and the screech-owl. The mulberry, and the guilandina, growing near our camp, with many of the plants and birds we had been accustomed to see in the frontier settlements of the United States, reminded us of the comforts of home and the cheering scenes of civilized society, giving us at the same time the assurance that we were about to arrive at the point where we should take leave of the desert.

Saturday, August 19th. The mercury at sunrise stood at 71°. The morning was calm, and the sky tinged with that intense and beautiful blue which marks many of our summer skies, and is seen with greater pleasure by those who know that home or a good tavern is near, than by such as have no prospect of shelter save what a tent or a blanket can afford. We were now looking with much impatience for something to indicate an approach towards the village of the Pawnee Piqua, but instead of this the traces of Indians seemed to become less and less frequent. Notwithstanding the astonishing numbers of bison, deer, antelopes, and other animals, the country is less strewed with bones than almost any we have seen; affording an evidence that it is not a favourite hunting ground of any tribe of Indians. The animals also appear wholly unaccustomed to the sight of men. The bisons and wolves move slowly off to the right and left, leaving a lane for the party to pass, but those on the windward side often linger for a long time, almost within the reach of our rifles, regarding us with little appearance of alarm. We had now nothing to suffer either from the apprehension

or reality of hunger, and could have been content that the distance between ourselves and the settlements should have been much greater than we supposed it to be.

In the afternoon, finding the course of the river again bending towards the north, and becoming more and more circuitous, we turned off on the right hand side, and choosing an east course, travelled across the hills, not doubting but we should soon arrive again at the river. We found the country at a distance from the bed of the river, somewhat elevated and broken, but upon climbing some of the highest hills, we again saw the landscape of the unbounded and unvaried grassy plain spread out before us. All the inequalities of the surface have evidently been produced by the excavating operation of currents of water, and they are consequently most considerable near the channels of the large streams. This remark is applicable to the vallies of all the large rivers in the central portions of the great horizontal formation west of the Alleghanies. We find accordingly, that on the Ohio, the Missouri, the Platte, the Konzas, and many of the rivers tributary to the Mississippi, the surface becomes broken in proportion as we proceed from the interior towards the bed of the river, and all the hills bear convincing evidence that they have received their existence and their form from the action of the currents of water which have removed the soil and other matters formerly occupying the vallies and elevating the whole surface of the country nearly to a common level. Regarding in this view the extensive vallies of the Mississippi and its tributaries, we naturally inquire how great a length of time must have been spent in the production of such an effect, the cause operating as it now does. It is scarcely necessary to remark, that where tributaries of the rivers in question are bounded on both sides, as they often are, by perpendicular cliffs of sandstone or limestone

in horizontal strata, the seams and markings on one side correspond with those on the other, indicating the stratifications to have been originally continuous.

A ride of a few miles in a direction passing obliquely from the river, brought us to a point which overlooked a large extent of the surrounding country. From this we could distinguish the winding course of a small stream, uniting numerous tributaries from the ridge we occupied, and pursuing its course towards the south-east, along a narrow and well-wooded valley. The dense and verdant foliage of the poplars and elms contrasted strongly with the bright red of the sandstone cliffs, which rose on both sides, far surpassing the elevation of the tallest trees, and disclosing here and there masses of sulphate of lime of a snowy whiteness. Looking back upon the broad valley of the river we had left, the eye rested upon insulated portions of the sandy bed disclosed by the inflections of its course or the opening of ravines, and resembling pools of blood, rather than wastes of sand. We had been so long accustomed to the red sands, that the intensity of the colouring ceased to excite any attention until a distant view afforded us the opportunity of contrasting it with the general aspect of the country.

The elevated plains we found covered with a plenteous but close-fed crop of grasses, and occupied by extensive marmot villages. The red soil is usually fine and little intermixed with gravel and pebbles, but too sandy to retain moisture enough for the purposes of agriculture. The luxuriance and fineness of the grasses, as well as the astonishing number and good condition of the herbivorous animals of this region, clearly indicate its value for the purposes of pasturage. There can be little doubt that more valuable and productive grasses than the native species can with little trouble be introduced. This may easily be effected by burning the prairies at a proper season of the year, and sowing the seeds

of any of the more hardy cultivated gramina. Some of the perennial plants common in the prairies will undoubtedly be found difficult to exterminate, their strong roots penetrating to a great depth and enveloping the rudiments of new shoots placed beyond the reach of a fire on the surface. The soil of the more fertile plains is penetrated with such numbers of these as to present more resistance to the plough than the oldest cultivated pastures.

We had continued our march until near sunset, expecting constantly to come in view of the river, which we were persuaded must soon make a great bend to the south, but perceiving the night would overtake us in the plains, we began to search for a place to encamp. The bison paths in this country are as frequent and almost as conspicuous as the roads in the most populous parts of the United States. These converge from all directions to the places where water is to be found, and by following their guidance we were soon led to a spot where was found a small spring dripping from the side of a cliff of sandstone. The water collected in a little basin at the foot of the cliff, and flowing a few rods down a narrow ravine, disappeared in the sand. Having established our camp, we travelled down this ravine, searching for plants, while any daylight remained. The rocks were beautifully exposed, but exhibited no appearance unlike what we had been accustomed to see along the river — the red indistinctly stratified sand-rock, spotted and veined with plaster-stone and selenite. About the shelvings and crevices of the rocks, the slender corolla of the œnothera macrocarpa, and the purple blossoms of the pentstemon bradburis, lay withering together, while the fading leaves and the ripening fruit seemed to proclaim the summer near its end.

On the morning following we resumed our march, altering our course from S.E. to N.E. The want of water in the hills compelled us again to seek the river. Falling in with a large bison path, which we

knew would conduct us by the easiest and most direct route, we travelled about fifteen miles, and encamped at noon on the bank of the river. In returning to the low grounds, we passed some grassy pastures, carpeted with the densest and finest verdure, and sprinkled with herds of deer, antelopes, and bisons. In some places the ground was covered with a purple mat of the aculeate leaves and branches of a procumbent eryngo; here rose the tall and graceful head of the centaurea speciosa [41], there, in more retiring beauty, crept a humble dalea, or an ascending petalostemum.

As we approached the river, we discovered a fine herd of bisons, in the grove where we intended to place our camp, some lying down in the shade, others standing in the pool of water, which extended along under the bank. Dismounting from our horses, and approaching under cover of the bushes, we shot two of the fattest, but before we had time to reload our pieces, after the second fire, we perceived a bull running towards us, evidently with the design to make battle; we, however, gave him the slip, by escaping into the thick bushes, and he turned off to follow the retiring herd.

It is only in the seasons of their loves, that any danger is to be apprehended from the strength and ferocity of the bison. At all other times, whether wounded or not, their efforts are to the last directed solely towards an escape from their pursuers; and at this time it does not appear that their rage is provoked, particularly by an attack upon themselves, but their unusual intrepidity is directed indiscriminately against all suspicious intruders.

We had now for some days been excessively annoyed with large swarms of blowing-flies, which had prevented our carrying fresh game along with us for more than a single day. It had been our custom at meals, to place our boiled or roasted bison-meat on the grass or the broken boughs of a tree, in the mid-

dle of our circle; but this practice we now found it inexpedient to continue, as, before we could finish our repast, our table often became white with the eggs deposited by these flies. We were commonly induced to dispense with our roast meats, unless we chose to superintend the cooking ourselves, and afterwards to devote the exertions of one hand to keep away the flies, while with the other we helped ourselves to what we wished to eat. Our more common practice was to confine ourselves to the single dish of hunter's soup, suffering the meat to remain immersed in the kettle until we were ready to transfer it to our mouths.

Gnats had been rather frequent, and we began to feel once more the persecutions of the ticks, the most tormenting of the insects of this country.

The little pool near our tent afforded all the water that could be found within a very considerable distance. The bisons came in from every direction to drink, and we almost regretted that our presence frighted away the suffering animals with their thirst unslaked.

August 21st. The day was warm and somewhat rainy. Soon after leaving our camp we saw three black bears, and killed one of them. This is the first animal of the kind we have eaten since we left the Missouri; and the flesh, though now not in the best condition, we found deserving the high encomiums commonly lavished upon it. Experienced hunters prefer it to the bison, and indeed to almost every thing except the tail of the beaver.

Black bears had been frequent in the country passed since the 15th. At this season they feed principally upon grapes, plums, the berries of the cornus alba, and C. circinata, and the acorns of a small scrubby oak, common about the sand hills.

They are also fond of the flesh of animals; and it is not uncommon to see them disputing with the wolves and buzzards, for their share of the carcasses

of bisons and other animals, which have been left by the hunters or have died of disease. Grapes had evidently been very abundant here, but had been devoured, and the vines torn in pieces by the bears and turkies.

In the middle of the day we found the heat more oppressive, with the mercury at 96°, than we had known it in many instances when the thermometer had indicated a higher temperature by six or eight degrees. This sultry calm was, however, soon succeeded by thunder-showers, attended with their ordinary effects upon the atmosphere. In the afternoon the country we passed was swarming with innumerable herds of bison, wild horses, deer, elk, &c. while great numbers of minute sand-pipers, yellow-shanked snipes, killdeer plovers, (charadrius vociferus,) and telltale godwits about the river, seemed to indicate the vicinity of larger bodies of water than we had been accustomed of late to see. During the afternoon and the night there was a continual and rapid alteration of bright calm and cloudless skies, with sudden and violent thunder-storms. Our horizon was a little obscured on both sides by the hills and the scattered trees which skirted along the sides of the valley. As we looked out of our tent to observe the progress of the night, we found sometimes a pitchy darkness veiling every object; at others, by the clear light of the stars and the constant flashing from some unseen cloud, we could distinguish all the features of the surrounding scene: our horses grazing quietly about our tent, and the famished jackal prowling near, to seize the fragments of our plentiful supper. The thunder was almost incessant, but its low and distant mutterings were at times so blended with the roaring of the bisons, that more experienced ears than ours might have found a difficulty in distinguishing between them. At a late hour in the night some disturbance was perceived among the horses, occasioned by a herd of wild horses, who had

come in, and struck up a hasty acquaintance with their enslaved fellow brutes.

As it was near daylight, we forbore to do any thing to frighten away the intruders, hoping, as soon as the light should be sufficient, to have an opportunity to prove our skill in the operation of "creasing." A method sometimes adopted by hunters for taking the wild horses, is to shoot the animal through the neck, using the requisite care not to injure the spine. There is a particular part of the neck through which a horse may receive a rifle ball without sustaining any permanent injury; the blow is, however, sufficient to produce a temporary suspension of the powers of life, during which the animal is easily taken: this is called creasing, and requires for its successful performance a very considerable degree of skill and precision in the use of the rifle. A valuable but rather refractory mule belonging to our party, escaped from the cantonment near Council Bluffs, a few days before we left that place. He was pursued by two men through the prairies of the Papillon, across the Elk Horn, and finally to the Platte, where, as they saw no prospect of taking him by other means, they resolved upon creasing. The ball, however, swerved an inch or two from its aim, and broke the neck of the animal.

NOTES.

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NOTE [1]. Page 5.

The gravity of the Indian is almost proverbial: he will smile, but he rarely laughs. He does not indulge in badinage, or unnecessary remarks respecting the weather, merely for the purpose of talking, and generally addresses his companions in a low voice, and with few words, excepting in council, when his elocution is loud, rapid, and vehement: the voice is full, harsh, and somewhat guttural. The squaw, not unfrequently, offers a perfect contrast in this respect, in her vivacious demeanour, shrill loquacity, and pleasant smile, and laugh, readily excited.

NOTE [2]. Page 95.

Genus *Pseudostoma.** SAY. — Cheek-pouches exterior to the mouth; incisores naked, truncated; molares sixteen, destitute of radicles; crown simple, oval; anterior ones double.

Species, *Pseudostoma bursaria.* — Body sub-cylindrical, covered with reddish-brown hair, which is plumbeous at base; feet white, anterior nails elongated, posterior ones short, and concave beneath.

Mus bursarius, (Shaw, Trans. Lin. Soc. Lond. and Genl. Zoology.) — *Body* elongated, sub-cylindrical; *hair* reddish-brown, plumbeous at base; *beneath* rather paler; *cheek-pouches* capacious, covered with hair both within and without; *vibrissæ* numerous, slender, whitish; *eyes* black; *ears* hardly prominent; *feet* five-toed, white, anterior pair robust, with large, elongated, somewhat compressed nails, exposing the bone on the inner side, middle nail much longest, then the fourth, then the second, then the fifth, the first being very short; posterior feet slender, nails concave beneath, rounded

* From ψευδω, *false*, and στομα, a *mouth*, in allusion to the false mouths or cheek-pouches.

at tip, the exterior one very small; *tail* short, hairy at base, nearly naked towards the tip.

This animal is congeneric with the Tucan of Hernandez, which Buffon erroneously considers the same as the *Talpha rubra Americana* of Seba, or *Talpha rubra*, Lin., an animal which is, however, entirely out of the question, and which, if we may be allowed to judge from Seba's figure, is so far from having any specific affinity with the *bursarius*, that it cannot now be regarded as co-ordinate with it.

The late professor B. S. Barton, in his Medical and Physical Journal, says, that a species of *Mus* allied to the *M. bursarius* of Shaw, is common in Georgia and Florida; that he examined a living specimen of this animal, and was convinced that it is no other than the Tucan of Hernandez, and the Tuza or Tozan of Clavigero. He says nothing of its size; but on the same page he remarks, "that another species of Mus, much larger the Tuza, inhabits west of the Mississippi about latitude 30°, of which very little is known." Dr. Barton was aware that the cheek pouches, in the figures given by Shaw, are represented in an inverted position, but not having seen specimens from the trans-Mississippi country, he was unacquainted with their specific identity with those of Canada, from which those figures were drawn. In our zoological reports to Major Long, in the year 1819, the specimens which we found on the Missouri were recorded under the name of *bursarius* of Shaw. Coxe, in his description of "Carolana called Florida, and of the Meschacebe," 1741, mentions a "rat with a bag under its throat, wherein it conveys its young when forced to fly."

Several other writers have noticed these animals, of whom Dr. Mitchell, in Silliman's Journal, 1821, mentions the identity of specimens obtained beyond Lake Superior, with the M. *bursarius* of Shaw.

The animals belonging to this genus are distinguished by their voluminous cheek-pouches, which are perfectly exterior to the mouth, from which they are separated by the common integument, they are profoundly concave, opening downwards, and towards the mouth.

The *incisores* which are not covered by the lips, but are always exposed to view, are strong and truncated in their entire width at tip; the superior ones are each marked by a deep, longitudinal groove near the middle, and by a smaller one at the inner margin. The *molares*, to the number of eight in each jaw, penetrate to the base of their respective alveoles,

without any division into roots, as in the genus *Arvicola*, *Lepus*, &c., their crown is simply discoidal, transversely oblong oval, margined by the enamel, and in general form they resemble the teeth of a *Lepus*, but without the appearance either of a groove at their ends, or of a dividing crest of enamel; the posterior tooth is rather more rounded than the others, and that of the upper-jaw has a small prominent angle on its posterior face; the anterior tooth is double, in consequence of a profound duplicature in its side, so that its crown presents two oval disks, of which the anterior one is smaller, and in the lower jaw somewhat angulated. All the molares of the lower jaw incline obliquely forward, and those of the superior jaw obliquely backward.

The whole animal has a clumsy aspect, having a large head and body, with short legs, large fore feet, and small hind feet; and although it walks awkwardly, yet it burrows with the greatest rapidity, so that the difficulty of obtaining specimens may be, in a great degree, attributed to the facility with which the animal passes through the soil, in removing from the vicinity of danger.

They cast up mounds of loose earth, which, like those of the *blind rat*, (Spalax typhlus) have no exterior opening. These elevations have been aptly compared, by Lewis and Clarke, to such heaps of earth as would be formed by the emptying of the loose contents of a flower-pot upon the soil. The mounds are of various dimensions, from the diameter of a few inches only, to that of several yards; the quantity of earth employed consequently varies from a pint to two or three bushels.

So entirely subterranean is the life of this animal, that it is rarely seen; and many persons have lived for many years surrounded by their little edifices, without knowing the singular being by whose labours they are produced.

It is known by the names of *sand-rat*, *goffer*, *pouched-rat*, *salamander*, *&c.*

NOTE [3]. Page 121.

Astragalus *carnosus*, N. A. *Missouriensis*, N. A. *Laxmani*, Ph.

Gaura *coccinea*, N. Troximon *marginatum*, Ph. Hymenopappus *tenuifolius*, Ph. Trichodium *laxiflorum*, Mx. Atheropogon *oligostachyum*, N. Viola *palmata*, Ph? in fruit. Hedeoma *hirta*, N. Hordeum *jubatum*, Anemone *tenella*, Ph. and other plants were among our collections of this day.

NOTE [4]. Page 140.

Arctomys Ludoviciana. ORD.—This interesting and sprightly little animal has received the absurd and inappropriate name of Prairie dog, from a fancied resemblance of its warning cry to the hurried barking of a small dog. This sound may be imitated with the human voice, by the pronunciation of the syllable cheh, cheh, cheh, in a sibilated manner, and in rapid succession, by propelling the breath between the tip of the tongue and the roof of the mouth. The animal is of a light dirty reddish-brown colour above, which is intermixed with some gray, also a few black hairs. This coating of hair is of a dark lead colour next the skin, then bluish-white, then light reddish, then gray at the tip. The lower parts of the body are of a dirty white colour. The head is wide and depressed above, with large eyes; the iris is dark brown. The ears are short and truncated; the whiskers of moderate length and black; a few bristles project from the anterior portion of the superior orbit of the eye, and a few also from a wart on the cheek: the nose is somewhat sharp and compressed; the hair of the anterior legs, and that of the throat and neck, is not dusky at base. All the feet are five-toed, covered with very short hair, and armed with rather long black nails: the exterior one of the fore foot nearly attains the base of the next, and the middle one is half an inch in length: the thumb is armed with a conic nail, three-tenths of an inch in length; the tail is rather short, banded with brown near the tip, and the hair, excepting near the body, is not plumbeous at base. *

The length of the animal, from the tip of the nose to the origin of the tail, is sixteen inches; of the tail, two inches and three-fourths; of the hair at its tip three-fourths of an inch.

As particular districts, of limited extent, are, in general, occupied by the burrows of these animals, such assemblages of dwellings are denominated *Prairie dog villages* by hunters and others who wander in these remote regions.

These villages, like those of man, differ widely in the extent of surface which they occupy; some are confined to an area of a few acres, others are bounded by a circumference of many miles. Only one of these villages occurred between the

* This description is drawn chiefly from a well-prepared specimen belonging to the Philadelphia museum, the tail of which, if we may decide from memory, is somewhat too short.

Missouri and the Pawnee towns; thence to the Platte they were much more numerous.

The entrance to the burrow is at the summit of the little mound of earth, brought up by the animal during the progress of the excavation below.

These mounds are sometimes inconspicuous, but generally somewhat elevated above the common surface, though rarely to the height of eighteen inches. Their form is that of a truncated cone, on a base of two or three feet, perforated by a comparatively large hole or entrance at the summit or in the side. The whole surface, but more particularly the summit, is trodden down and compacted, like a well-worn pathway. The hole descends vertically to the depth of one or two feet, whence it continues in an oblique direction downward.

A single burrow may have many occupants. We have seen as many as seven or eight individuals sitting upon one mound.

They delight to sport about the entrance of their burrows in pleasant weather; at the approach of danger they retreat to their dens; or when its proximity is not too immediate, they remain, barking, and flourishing their tails, on the edge of their holes, or sitting erect to reconnoitre. When fired upon in this situation, they never fail to escape, or if killed, instantly to fall into their burrows, where they are beyond the reach of the hunter.

As they pass the winter in a lethargic sleep, they lay up no provision of food for that season, but defend themselves from its rigours by accurately closing up the entrance of the burrow. The further arrangements which the Prairie dog makes for its comfort and security are well worthy of attention. He constructs for himself a very neat globular cell with fine dry grass, having an aperture at top, large enough to admit the finger, and so compactly formed that it might almost be rolled over the floor without receiving injury.

The burrows are not always equidistant from each other, though they occur usually at intervals of about twenty feet.*

* In these villages, where the grass is fed close, and where much fresh earth is brought up and exposed to the air, is the peculiar habitat of a species of Solanum approaching the S. *triflorum* of Nuttall, which, he says, occurs as a weed "about the gardens of the Mandans and Minatarees of the Missouri, and in no other situations." It appears to differ from the S. triflorum in being a little hirsute, with flat, runcinate, pinnatifid leaves, and the peduncles alternating with the leaves. The Solanum *heterandrum* of Pursh, now referred to the new genus Androcera of Nuttall, is also very common, but is not confined, like the plant just mentioned, to the marmot villages. We

NOTE [5]. Page 142.

Among other plants collected along the Platte on the 15th and 16th June, are the Cherianthus *asper*, N., Helianthemum *canadense*, Atheropogon *apludoides*, N., Myosotis *scorpioides*, Pentstemon *gracile*. N. The Cherianthus *asper* is intensely bitter in every part, particularly the root, which is used as medicine by the Indians. In depressed and moist places along the river, we observed a species of Plantago, which is manifestly allied to P. *eriophora* of Wallich, Flor. Ind. p. 423, also to P. *attenuata* of the same work, p. 422. The base of the scape and leaves is invested with a dense tuft of long fine wool, of a rusty brown colour. Before the plant is taken up this tuft is concealed in the soil, being a little below the surface, but it adheres closely to the dried specimen. Its leaves, which are the size of those of P. *lanceolata*, are smooth, fine nerved, with a few remote denticulations. Scape slender, exceeding the leaves; bractæas ovate, spike slender, few-flowered — P. *attenuata*, Bradbury?

NOTE [6]. Page 149.

Other plants found here, where the great sunflower Helianthus *giganteus*, Asclepias *obtusifolia*, Ph., A. *viridiflora*, Ph., A. *syriaca*, and A. *incarnata*, Amorpha *canescens*, N., Erigeron *pumilum*, N., A. Veronica approaching V. *beccabunga* Scuttellaria *galericulata*, Rumex *venosus*, N., and several which are believed to be undescribed.

NOTE [7]. Page 149.

In rain water puddles, we remarked a new species of Branchiopode belonging to the genus Apus; small crustaceous animals, which exhibit a miniature resemblance to the King or Horse-shoe Crab, (Himulus polyphemus,) of our sea coast, but which are furnished with about sixty pairs of feet, and swim upon their back. The basins of water, which contained them, had been very much diminished by evaporation and infiltration, and were now crowded to excess, principally with

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collected also the Psoralea *cuspidata*, Ph. P. *esculenta*, N. P. *incana*, N. also a species of Hieracium — H. *runcinatum*. Plant hirsute, leaves all radical, eliptic-oblong, runcinate; scape few-flowered, somewhat compressed, and angular; glands on the hairs of the calix, very small and diaphanous; about one foot high; flower small. Hab. in depressed, grassy situations along the Platte.

the apus, great numbers of which were dying upon the surrounding mud, whence the water had receded. This species is distinguished from the *productus* of Bosc, and *montagui* of Leach, by not having the dorsal carina prolonged in a point behind; and from *cancriformis*, by the greater proportional width of the thorax, and more obtuse emargination behind. The length of the thorax along the middle, is three-tenths of an inch, and its greatest breadth somewhat more. It may be named *Apus obtusus*.

A very large species of Cypris, also inhabits these small rain-water pools in great numbers, of which the valves are more than one-fifth of an inch in length.

NOTE [8]. Page 151.

Castor fiber. — Some of the European naturalists appear to be in doubt, whether or not the beavers of Europe are of the same species with ours, from the circumstance of the former not erecting habitations for themselves, thus appearing to differ at least in habit, from the North American, (which are usually but improperly called, Canada beaver, as they are not confined to Canada, but are found far south in the United States, and east to the confluence of the Ohio and Mississippi,) but it is possible, that the aboriginal manners of the European beavers, corresponded with those of ours, and that necessity, resulting from the population of the country by civilized man, compelled them to resort to a different mode of life, to escape the certain destruction, with which the great demand for their fur threatened them. But as the European beaver is smaller than ours, other naturalists have regarded it as a distinct species. In those districts of country of North America, from which they have not yet been exterminated, and which are populated by the whites, as particularly on the Mississippi, above the Ohio, and below St. Louis, we have not heard that they build, but it is more than probable, that, as in Europe, they change their mode of life, in order to be the more effectually concealed from view. From subsequent observation, we have learned, that the beaver does not attempt to dam large streams, perceiving at once the impracticability of the undertaking: his object in damming a stream appears to be, to preserve a constancy in the height of the water, in order that the entrance to his habitation in the bank may be concealed, and that the curious conical edifice may not be destroyed by a sudden flood, or too much exposed by a deficiency of water.

An Indian informed us, that in his time, he has caught three specimens of this animal, that had each a large white spot on the breast. Singular accounts of this animal are given us by the hunters, but which we had no opportunity of verifying.

Three beavers were seen cutting down a large cotton-wood tree; when they had made considerable progress, one of them retired to a short distance, and took his station in the water, looking steadfastly at the top of the tree. As soon as he perceived the top begin to move towards its fall, he gave notice of the danger to his companions, who were still at work, gnawing at its base, by slapping his tail upon the surface of the water, and they immediately ran from the tree out of harm's way.

The spring beaver are much better for commerce than those of the autumn and early winter, as the fur is longer and more dense. But the beaver taken in the vicinity of the Rocky Mountains is almost equally good during the year.

Mr. Frazer, a gentleman who has been several years engaged in the fur trade, in the interior of North America, on the Columbia, and in North California, in speaking of the beaver, mentioned a circumstance, which we do not remember to have seen recorded. The lodges are usually so placed, that the animals ascend the stream some distance to arrive at the spot whence they procure their food. They make their excursions under water, and they have, at equal distances, excavations under the bank, called *washes*, into which they go and raise their heads above the surface, in order to breathe, without exposing themselves to be seen. In winter the position of these washes is ascertained, by the hollow sound the ground returns when beaten; and the beavers are sometimes taken, by being pursued into these holes, the entrances to which are afterwards closed.

Otters are frequent on the Missouri. We had an opportunity of seeing on the ice of Boyer Creek a considerable number of the tracks or paths of otters; they were the more readily distinguishable, from there being snow of but little depth on the ice, and they appeared as if the animal was accustomed to slide in his movements on the ice, as there were, in the first place, the impressions of two feet, then a long mark clear of snow a distance of three or four feet, then the impressions of the feet of the animal, after which the sliding mark, and so on alternately. These paths were numerous,

and passed between the bank and a situation, where a hole had been in the ice, now frozen over.

NOTE [9]. Page 154.

Considerable additions were made, about the forks of the Platte, to our collections of plants. We found here, among others, the Pentstemon cristatum, N. Coronopus dydima, Ph. Evolvulus Nuttallianus, Roemer, and Shultz. Orobus dispar, Cleome tryphilla, Petalostemon candidum, Ph., and P. violaceum. Aristida pallens, N. two species of a genus approximating to Hoitzia, several species of Astragalus, and many others.

NOTE [10]. Page 168.

We may add on this subject the testimony of Lawson, the early historian of North Carolina. After describing the huts of the native inhabitants, he adds, "These dwellings are as hot as stoves, where the Indians sleep and sweat all night; yet I never felt any ill unsavory smell in their cabins, whereas should we live in our houses as they do, we should be poisoned with our own nastiness; which confirms the Indians to be, as they really are, some of the sweetest people in the world." New Voyage to Carolina, p. 177. London, 4to. 1709.

NOTE [11]. Page 172.

A small fox was killed, which appears to be the animal mentioned by Lewis and Clarke, in the account of their travels, under the name of the *burrowing fox*, (vol. ii. p. 351.) It is very much to be regretted, that although two or three specimens of it were killed by our party, whilst we were within about two hundred miles of the mountains, yet from the dominion of peculiar circumstances, we were unable to preserve a single entire skin; and as the description of the animal taken on the spot was lost, we shall endeavour to make the species known to naturalists, with the aid only of a head and a small portion of the neck of one individual, and a cranium of another, which are now before us.

In magnitude, the animal is hardly more than half the size of the American red fox, (*Canis Virginianus*, of the recent authors,) to which it has a considerable resemblance. But, that it is an adult, and not the young of that species, the pre-

sence of the large carnivorous tooth, and the two posterior molar teeth of the lower jaw, on each side, sufficiently attest; these teeth, as well as all the others, being very much worn down, prove that the milk teeth have been long since shed.

The teeth, in form, correspond to considerable exactness with those of our red fox; but the anterior three and four false molares of both these species are sufficiently distinguished from the corresponding teeth of the gray, or tri-coloured fox (C. cinereo-argenteus) by being wider at base, and less elongated perpendicularly, and by having the posterior basal lobe of each, longer and much more distinctly armed with a tubercle at tip.

Besides this disparity of dentition in the red and gray foxes, the general form of the cranium, and its particular detailed characters, as a less elevated occipital, and temporal crest, more profoundly sinuous junction of the malar with the maxillary bone, the absence of elevated lines bounding the space between the insertions of the lateral muscles, passing in a slightly reclivate direction between the orbital processes, and the anterior tip of the occipital crest, and in particular the want of an angular process of the lower jaw beneath the spinous process in the cranium of the red fox, are sufficiently obvious characters to indicate even by this portion of the osseous structure alone, its specific distinctness from the gray fox. In these differences the osteology of the burrowing fox equally participates, and although besides these characters in common with the red fox, we may observe a correspondence in many other respects, yet there are also many distinctions which the cranium of this small species will present, when more critically compared with that well known animal, which unequivocally forbid us from admitting their identity. The common elevated space on the parietal bones between the insertions of the lateral muscles is one-fourth wider, and extends further backward, so as to embrace a notable portion of the anterior angle of the sagitto-occipital crest; the recipient cavity in the inferior jaw for the attachment of the masseter muscle is more profound, and the coronoid process, less elevated than the top of the zygomatic arch, is more obtusely rounded at tip than that of the red fox.

The dimensions of the cranium, as taken by the calipers:

The entire length from the insertion of the superior incisores to the tip of the occipital crest, is rather more than four inches and three-tenths. The least distance between the orbital cavities, nine-tenths. Between the tips of the orbital

processes less than one inch and one-tenth. Between the insertions of the lateral muscles, at the junction of the frontal and parietal bones, half an inch. Greatest breadth of this space on the parietal bones thirteen-twentieths of an inch.

The hair is fine, dense, and soft. The head above is fulvous, drawing on ferruginous, intermixed with gray, the fur being of the first-mentioned colour, and the hair whitish at base; then black; then gray; then brown. The ridge of the nose is somewhat paler, and a more brownish dilated line passes from the eye to near the nostrils, (as in the C. corsac). The margin of the upper lip is white; the orbits are gray; the ears behind are paler than the top of the head, intermixed with black hairs and the margin, excepting at tip, white; the inner side is broadly margined with white hairs; the space behind the ear is destitute of the intermixture of hairs; the neck above has longer hairs, of which the black and gray portions are more conspicuous; beneath the head pure white.

The body is slender, and the tail rather long, cylindrical, and black.

It runs with extraordinary swiftness, so much so, that when at full speed, its course has been by the hunters compared to the flight of a bird skimming the surface of the earth. We had opportunities of seeing it run with the antelope; and appearances sanctioned the belief, that in fleetness it even exceeded that extraordinary animal, famed for swiftness, and for the singularity of its horns. Like the corsac of Asia it burrows in the earth, in a country totally destitute of trees or bushes, and is not known to dwell in forest districts.

If Buffon's figure of the corsac is to be implicitly relied upon, our burrowing fox must be considered as perfectly distinct, and anonymous; we would, therefore, propose for it the name of *velox*.

NOTE [12]. Page 174.

The results of several observations are as follows:

	Temperature of the water.	Temperature of the air.
June	27, 68°	83°
	28, 70	79
	29, 74	82
	30, 75	80
July	1, 71	60

At eleven, A. M.

Before sunrise the mercury fell usually as low as 60°.

NOTE [13]. Page 177.

Rays of light, falling with any degree of obliquity upon the particles of that portion of watery vapour which lies near the surface of the earth, may be reflected, and pass off at an equal corresponding angle; so that if the eye be raised a few feet above the reflecting surface, an image of the corresponding arc of the sky is produced, as in the case of a sheet of water where the image, seen by the reflected light, is not that of the water, but the sky. Hence any object, which obstructs the rays of light in their passage from the parts of the atmosphere beyond the reflecting surface to that surface, is returned to the eye in a darkened image as from water.

NOTE [14]. Page 182.

Other plants were collected about this encampment, among which we distinguish an interesting species of ranunculus, having a flower somewhat larger than that of R. fluviatilis with which it grows, often extending, however, to some distance about the margins of the pools in which it is principally found. R. *amphibius*; slender, floating or decumbent, leaves reniform, four or five lobed, divisions cuneate, oblong, margin crenate, petioles long and alternate. The submersed leaves are, in every respect, similar to the floating ones. Pentstemon *erianthera*, N., Poa *quinquefida*, Potentilla *anserina*, Scrophularia *lanceolata*, Myosotis *glomerata*, N.? &c. were also seen here.

NOTE [15]. Page 183.

Crotalus tergeminus, S. — *Body* dusky cinereous, a triple series of deep brown spots; beneath with a double series of black spots.

Body pale cinereous brown, a triple series of fuscous spots, dorsal series consisting of about forty-two large, transversely oblong-oval spots, each widely emarginate before, and obsoletely edged with whitish lateral series, spots transversely oval, opposite to those of the back; between the dorsal and lateral series is a series of obsolete, fuliginous spots, alternating those of the two other series; *head* above with nine plates on the anterior part, on which are a band and about three spots, two undulated vittæ terminating and confluent with the first spot of the neck, a black vittæ passes through the eye, and terminates on the neck each side; *beneath* white,

a double irregular series of black spots, more confused towards the tail; *tail* above, with five or six fuscous fasciæ, beneath white irrorate with black points, six terminal plates bifid.

Length - -	2 ft. $2\frac{1}{8}$ in.
tail - -	$2\frac{1}{8}$ in.
Plates of body - -	151
of tail - -	19
Bifid plates at tip - -	6

Another specimen, much smaller, Pl. 152. subcaudal, 20. scales at tip 3.

NOTE [16]. Page 185.

The ripened fruit of this widely-distributed shrub is variable in colour. In dry and exposed situations about the higher parts of the mountains, we have met with the berries of a deep purple, while in the low grounds, they are fulvous or nearly white. On the Cannon-ball creek we saw also the common virgin's bower. Clematis *virginica*, Ph. Lycopus *europeus*, Liatris *graminifolia*, Sium *latifolium*, Œnothera *biennis*, and other plants, common in the east, with the more rare Linum *Lewisii*, Ph. and Eriogonum *sericeum*, &c.

NOTE [17]. Page 190.

Genus *Galeodes*, OLIV.—1. G. *pallipes*, SAY.—Hairy, mandibles horizontal, fingers regularly arquated, abdomen subdepressed livid.

Body pale yellowish-brown, hairy; *feet* paler, whitish, first pair smallest, fourth pair largest and longest; *abdomen* livid, hairy, sub-depressed; *palpi* more robust than the three anterior pairs of feet, of subequal diameter, but rather thicker towards the tip; more hairy than the feet; *eyes* and *tubercle* blackish; *mandibles* dilated, with numerous rigid setæ, and with parallel setæ projected over the fingers; *fingers* regularly arquated, reddish-brown at tip, and with a reddish-brown line above and beneath, within armed with many robust teeth; *thorax* with a deep sinus at the anterior angles.

2. G. *subulata*, SAY. — Hairy; *mandibles* horizontal; *thumb* nearly rectilinear, destitute of teeth. This species has the strongest resemblance to the preceding, both in form, magnitude, and colouring; but the superior finger of the mandibles is unarmed, and rectilinear or very slightly flexuous; the inferior finger is arquated, with about two robust teeth.

NOTE [18]. Page 190.

G. *intermedium*, I. — Cespitose, sub-erect, pubescent, sparingly branched above. Radical leaves reniform deeply 5-cleft. The flower is a little larger than that of G. *robertianum*, and similarly coloured, having whitish lines towards the base of the corolla. We also saw here the Campanula *decipiens*, *Tens.* Lysimachia *ciliata*, Ph. Troximon *glaucum*, N., with two or three belonging to Geneva, with which we were unacquainted.

NOTE [19]. Page 190.

Genus *Troglodytes*. CUV. — T. *obsoleta*, SAY. — Above dusky-brownish, slightly undulated with pale, tinted with dull ferruginous on the top of the head, and superior portion of the back; *sides of the head* dull whitish, with a broad brown line passing through the eye to the origin of the neck; *primaries* plain, being entirely destitute of undulations or spots; *tail coverts* pale, each with four or five fuscous bands; *chin*, *neck beneath*, and *breast* whitish, each feather marked by a longitudinal line of light brown; *belly* white; *flanks* a little tinged with ferruginous; *inferior tail coverts* white, each feather bifasciate with black-brown; *tail* simple, broadly tipped with ferruginous-yellow, and with black before the tip, the remaining portion colour of the wings, and obsoletely banded; these bands are more distinct on the two middle feathers, which are destitute of the black and yellowish termination; exterior plume marked by four yellowish white spots on the exterior web, and by two larger ones on the inner web; the tip is dusky, length six inches; bill, from the corner of the mouth, rather more than one inch.

NOTE [20]. Page 195.

Among many plants collected in this excursion, some of them new to us, we recognized an old acquaintance in the bearberry (Arbutus *uva-ursi*, L.) an inhabitant of the mountainous districts of New York and New England; also the Dodecatheon *integrifolium*, Ph.; and a beautiful little plant referable to the genus Mentzelia of Plumier. On the higher parts of the mountain an oak is common, approaching in character to the Quercus *banisteri*, Mx. Also a small undescribed acer, the Juniperus *communis* and I. *virginiana*; in the ravines, the Rhus *toxicodendron*, Spiræa *opulifolia*, olc; and at the base of the mountains the Prenanthes *runcinata*, *leaves*

runcinate pinnatifid, ¾ inches long, five lines wide. Resembles P. *Juncea*, Saxifraga *nivales*, L. A. cerastium, olc.

NOTE [21]. Page 204.

A. *cærulea*, JAMES.—Leaves twice ternate; flowers terminal, remote, nectaries strait and very long. It inhabits shady woods of pine and spruce within the mountains, rising sometimes to the height of three feet. In passing from the head-waters of the branch of the Platte, called Defile creek, to those of one of the northern tributaries of the Arkansa, we noticed some change in the soil, and soon met with many plants we had not before seen. Several of these, as the common juniper and the red cedar, (Juniperus *virginiana*, Ph.) the black and hemlock-spruce, (Abies *nigra* and A. *canadenois*) the red maple (Acer rubrum, Mx.) the hop horn-beam (Ostrya Virginica, L.) the Populus *tremuloides*, Mx. Pinus *resinosa*, Pyrola *secunda*, Orchis *dilatata*, olc. are common to mountainous districts in all the northern parts of the territory of the United States; many others are here found, which require more careful and extensive comparison with the plants of Mexico, Siberia, and other counties, than we have yet had the opportunity to make.

NOTE [22]. Page 206.

One of these is a large and conspicuous plant of the natural family of the *Cruciferæ*, which may be referred to the new genus, Stanley of Nuttall, and distinguished as S. *integrifolia*; stem simple, leaves entire, ovate oblong, tapering to both ends; stem angular. Flowers in a terminal raceme, which is a little branched below; about six inches in length; stipe of the silique, about as long as the pedicle; flowers large yellow. The whole plant, seen at a little distance, has a remote resemblance to Lysimachia thyrsifolia. The leaves are $\frac{5}{6}$ inches long, $\frac{2}{3}$ wide, glaucous, and veined, nearly resembling those of the common cabbage, but smoother, which they are not wholly unlike in taste. The calyx is large, and of a brighter yellow than the other parts of the flower: it inhabits the summits of the sandstone ridges, along the base of the mountains. The S. *pinnatifida*, N., the original type of this genus, was found by its discoverer, Mr. Nuttall, to act as a violent emetic. It had been eaten by several of the party who accompanied him, as a substitute for cabbage.

NOTE [23]. Page 209.

Cucumis perennis, S. — Calyx, seated upon the germ, rugose, coloured campanulate, exterior divisions subulate.

Masc. Three filaments, short, closely covering the central disc. Fœm. Style short, stigmas three bipartite.

Fruit. Pome large, orbicular, smooth, about four celled seeds, ovate, gibbous, margin acute; dissepiments torn, spongy; seeds in a double order; leaves alternate, triangularly cordate, margin undulate, tendrils axillary trichotomous; stems numerous, procumbent, grooved; flowers nearly as large as those of Cucurbita *pepo*; fruit round, smooth, and green, nearly sessile, resembling a small unripe water-melon. The leaves are rough, of a glaucous green colour, bitter and nauseous to the taste, and the whole plant emits a fœtid odour.

Root fusiform, very large, six feet in length, and often four inches in diameter, descending perpendicularly into the earth. It inhabits the arid and sandy wastes, along the base of the Rocky Mountains, from the confluence of the Arkansa, and Boiling Spring Fork, to the sources of Red River. By means of its long and somewhat succulent root it is peculiarly adapted to the soil it occupies, and is found to thrive with considerable vigour in wastes whose thirsty and burning soils bid defiance to almost every other vegetable. It flowers in July, and continues flowering and perfecting fruit during the summer. Some plants of this interesting species are growing in the garden of the University at Philadelphia, from seeds brought by Major Long, but they have not yet flowered. The leaves are thick and robust, from six to eight inches long, and four or five in width, on foot-stalks equalling the leaves in length; they are crowded along the stems, and usually stand erect. It does not appear that any insect or animal preys upon the leaves or other parts of this plant. It forms, by its deep green, a striking contrast to the general aspect of the regions it inhabits, which are exceedingly naked and barren.

This plant has been mentioned by Mr. Brackenridge, from the information of hunters, but no detailed account of it has hitherto been given. The annexed figure is from a drawing by Mr. Peale, made of the plant in its native locality. The petioles and the extremities of the stems are usually affected with morbid enlargements, resembling galls. They may perhaps be caused by the irritation of the intense reflected light and heat of the sun, in the situations where the plant usually

grows. In the gardens it has not hitherto produced these enlargements.

NOTE [24]. Page 210.

1. *Fringilla psaltria*, SAY.—A very pretty little bird, was frequently seen hopping about in the low trees or bushes, singing sweetly, somewhat in the manner of the American gold-finch, or Hemp-bird (Fringilla tristis). The tints, and the distribution of the colours of its plumage resemble, in a considerable degree, those of the autumnal and less brilliant vesture of that well-known species. It may, however, be distinguished, in addition to other differences, by the black tip of its tail-feathers, and the white wing spot.

The *head* is capped with black; the *cheeks* are dusky; the *bill* yellow, with a black tip; *iris* burnt umber; *neck* above, and half its side, *back*, and *rump* olivaceous, more or less intermixed with dusky; *smaller wing coverts* blackish, edged with olivaceous; *greater wing coverts* brown-black, tipped with white, forming a narrow band; *primaries* fuscous, and, excepting the exterior one, slightly edged with white; third, fourth, and fifth feathers white towards the base, so as to exhibit a white spot beyond the wing coverts; *secondaries* margined with white exteriorly towards their tips: *tail coverts* black, varied with olivaceous on their shafts; *tail* emarginate, feathers blackish, slightly edged with dull whitish; the three exterior ones pure white on their inner webs, excepting at base and tip; all *beneath* yellow; *feet* pale. A specimen is deposited in the Philadelphia Museum.

2. *Fringilla frontalis*, SAY.—Crimson-necked Finch. *Head, throat, neck beneath*, and *upper portion of the breast* brilliant crimson, most intense near the bill and over the eyes; *rump* and *tail coverts* paler crimson; between the bill and the eye grey; *bill* dark horn colour, lower mandible paler; *vertex, occiput, neck above* and *each side* brown, tinged with reddish, the feathers margined with pale; *back* dusky brownish; *wings* and *tail* fuscous, the latter feathers edged on the inner side with white; the *primaries* broadly margined within, towards the base, with white, and exteriorly edged with a grayish; *coverts* and *tertials* edged with dull grayish; *inferior portion of the breast*, the *belly*, and *vent* whitish, each feather with a broad fuscous line.

Female, dusky brown, the feathers margined each side with dull whitish; *wings* fuscous, the margining and edging of the feathers not as distinct as in the male; all *beneath*, excepting

the tail and wing feathers, whitish, each feather with a brown streak.

This bird is much more closely allied, both in size and colouring, to the purple Finch (F. purpurea) than to the crimson-headed Finch (F. rosea), and may prove to be only a variety of it, when a comparison of many individuals can be made. The male, from which the above description is drawn out, may not be in its ultimate state of plumage, as it seems probable that the middle of the head, the upper part of the neck, and the back, in the perfect plumage, is more obviously tinted with crimson than we have observed those parts to be. It differs, however, from the *Purple Finch* in the tint of the crimson colour, which is far more lively and brilliant, and also in having each feather of the belly, vent, and inferior tail coverts broadly streaked with brown. We apply to it provisionally the name of *F. frontalis*. A prepared specimen of this bird is in the Philadelphia Museum.

NOTE [25]. Page 213.

It is well known that water, in which carbonic acid is dissolved, has the power of holding in solution a portion of lime, somewhat proportioned in quantity to the acid. In this instance, the water no sooner comes in contact with the atmosphere than it parts with a portion of its fixed air, consequently loses the power of holding in solution the lime which is immediately deposited. The lime may perhaps, in this instance, be derived from the cement of the sand-rock.

NOTE [26]. Page 234.

"From information derived from the Indians and hunters who have frequently visited this part of the country, as also from the account given by Pike, relative to this peak, it appears that no person, either civilized or savage, has ever ascended to its summit, and that the ascent was deemed utterly impracticable. Dr. James having accomplished this difficult and laborious task, I have thought proper to call the peak after his name, as a compliment to which his zeal and perseverance, together with the skilful attention with which he has examined its character and productions, give him the fairest claim. Pike has indeed given us notice that there is such a peak, but he only saw it at a distance; the unfavourable circumstances under which he came into its neighbourhood preventing his arrival even at its base. He attempted to ascer-

tain its altitude, but it is believed his estimate is very erroneous." Ext. from Maj. Long's MS. Notes of July 15th, 1820.

NOTE [27]. Page 235.

Genus *Sciurus*, L.—S. *quadrivittatus*, SAY.—*Head* brownish intermixed with fulvous, and with four white lines, of which the superior one on each side passes from the tip of the nose immediately over the eye to the superior base of the ear; and the inferior one passes immediately beneath the eye to the inferior base of the ear; *ears* moderate, semi-oval, incisores reddish-yellow; *back* with four broad lines, and alternate mixed black and ferruginous ones; *sides* fulvous, beneath whitish; *tail* moderate, hair black at base, then fulvous, black in the middle, and paler fulvous at tip; *beneath* fulvous with a submarginal black line; *thumb* of the anterior feet a prominent tubercle.

Length from the nose to the base of the tail - $4\frac{1}{4}$ inches.
——— of the tail - - - - - 3
——— of the hair at the tip of the tail - - 1 nearly.

NOTE [28]. Page 235.

Genus *Sciurus*, L.—S. *lateralis*, SAY.—*Above* brownish cinereous intermixed with blackish; on each side of the back a dull yellowish-white dilated line, broader before, margined above and beneath with black, originating upon the neck anterior to the humerus, and not attaining the origin of the tail; no appearance of a vertebral line; thigh, neck anterior to the tip of the white line, and top of the head tinged with ferruginous; *orbits* whitish; *tail* short, thin, with a submarginal black line beneath; *nails* of the anterior feet elongated: *thumb tubercle* furnished with a broad nail; *sides* dull yellowish-white; *beneath* pale, intermixed with blackish.

NOTE [29]. Page 235.

Hirundo lunifrons, SAY. — *Above* brownish-black, more or less varied with violaceous on the back and wing-coverts; *top of the head* exclusively blackish-violaceous, a large white frontal lunule; *bill* black; *rump* and *tail coverts* pale ferruginous; *chin*, *throat*, and *neck* beneath, dark ferruginous extending in a narrow band upon the hind head; *breast* pale rufous ash; *axillæ* and *inferior wing coverts* dirty brownish;

shoulders dull whitish, with small black and pale ferruginous spots; *belly* and *vent* flanks white, obsoletely dashed with brown; *inferior tail coverts* dusky, margined with white; *tail* entire, not surpassing the tips of the wings, the exterior feather margined with white on the inner web; *wing* and *tail-shafts* brown above, white beneath; *the tail feathers* in some lights have a slightly-banded appearance. Length $5\frac{1}{2}$ inches.

NOTE [30]. Page 236.

Genus *Coluber*. — C. *testaceus*, SAY. — Pale sanguineous, or testaceous above, beneath sanguineous immaculate. Pl. 198. Sc. 80?

This is a large species equal in size to the C. *constrictor*. It moves with great rapidity, and in general form and size it resembles C. *constrictor*. The scales are large. A specimen is in the Phiadelphia Museum.

NOTE [31]. Page 236.

Emberiza amœna, SAY. — *Head* and *neck* bluish green; *back* brownish black more or less intermixed with blue and a little brown ferruginous; *rump* pure blue; *smaller wing coverts* dull blue, brown at base, and tipped with white, forming a band; *greater wing coverts* blackish, tipped with white, forming a narrow band; *wing* and *tail feathers* blackish-brown with blue exterior margins; *belly, inferior tail coverts* and *lower part of the breast* white; *superior portion of the breast* pale ferruginous; *neck* bright green; *bill* and *feet* pale.

NOTE [32]. Page 236.

Genus *Crotalus*, LIN. — C. *confluentus*, SAY. — Brownish, varied with greenish-yellow, a triple series of brown spots, the anterior vertebral ones confluent, and the posterior ones separated into bands.

Body brownish cinereous, varied with greenish yellow; a triple series of fuscous spots; dorsal series consisting of about forty-four large traversely oblong oval spots, each widely emarginate before and behind, and, excepting the posterior ones, edged with greenish-white, the ten or twelve anterior ones crowded and confluent, those of the thicker part of the body separate, those near the cloaca and upon the tail united with the spots of the lateral series, and forming bands; lateral series, spots rounded, opposite to those of the back; between the dorsal and lateral series is a series of obsolete, fuliginous

spots, alternating with those of the two other series; *head* above scaly, scales of the superior orbits, and of the anterior margin, larger and striated; *beneath* yellowish-white, immaculate. Plates of the body 179; of the tail 27.

NOTE [33]. Page 238.

Genus *Ameiva*. — A. *tessellata*, SAY. Tesselated lizard. — The back and sides of the body and neck are marked by nine or ten longitudinal lines, and eighteen or twenty transverse ones, dividing the whole surface in a tesselated manner, the interstitial quadrate spaces being black; these lines are light brown on the back, and assume a yellow tint on the sides; the scales of these portions of the body are very small, convex, and rounded; *the top of the head* is olivaceous, covered by plates arranged thus: 2 with an intermediate small one at their tips; 1, 2, 1, the largest, 2, and 3; superior orbits of the eyes with four plates, of which the two intermediate ones are much the largest; *belly* bluish white; *throat* and *neck* tinged with yellow, and covered with somewhat larger scales than those of the back; *anterior feet* yellowish within, and covered with minute scales; on the exterior and posterior sides greenish white with confluent black spots and large scales; *posterior feet* behind greenish white with confluent black spots and minute scales; the anterior side yellowish covered with large scales; pores of the thigh very distinct and prominent; *tail* elongated, rounded above, light brown, with a few lines of black spots near the base; *beneath* yellowish white immaculate, the scales carinated, and placed in transverse series. Total length 1 foot, tail 8½ inches.

NOTE [34]. Page 244.

Grizzly bear (*Ursus horribilis*, ORD). — *Hair* long, short on the front, very short between and anterior to the eyes, blacker and coarser on the legs and feet, longer on the shoulders, throat, and behind the thighs, and beneath the belly, and paler on the snout; *ears* short, rounded; *front* arquated, the line of the profile continued upon the snout, without any indentation between the eyes; *eyes* very small, destitute of any remarkable supplemental lid; *iris* burnt sienna or light reddish brown; *muffle of the nostrils* black, the sinuses very distinct and profound; *lips*, particularly the superior one, anteriorly extensile, with a few rigid hairs or bristles; *tail* very short, concealed by the hair. The hair gradually diminishes in length upon the leg, but the upper part of the foot is

still amply furnished; *teeth, incisores* six, the lateral one with a tubercle on the lateral side; *canines* large, robust, prominent; a single false molar behind the canine, remaining *molares* four, of which the anterior ones are very small, that of the upper jaw particularly, that of the lower jaw resembling the second false molar of the common dog; *anterior feet*, claws elongated, slender *fingers*, with five suboval naked tubercles separated from the palm, from each other, and from the base of the claws by dense hair; *palm* on the anterior, half naked, transversely oval; base of the palm with a rounded naked tubercle, surrounded by the hair; *posterior feet* with the sole naked, the nails moderate, more arquated, and shorter than the anterior ones.

The nails do not in the least diminish in width at the tip, but they become smaller towards that part only from diminishing from beneath.

"Testicles suspended in separate pouches, at the distance of from two to four inches from each other." Lewis and Clarke.

They vary exceedingly in colour, and pass through the intermediate gradations from a dark brown to a pale fulvous, and a grayish.

Dimensions (from the prepared Specimen).

	ft.	in.
Length from the tip of the nose to the origin of the tail	5	2
Trunk of the tail (exclusive of the hair at tip)		$1\frac{3}{4}$
From anterior base of the ear to the tip of the nose		12
From anterior canthus of the eye to the tip of the nose		6
From orbit of the eye		$\frac{3}{4}$
From between the eyes		$4\frac{2}{5}$
Ears from their superior base		3
Longest claw of anterior feet		$4\frac{1}{5}$
Shortest ditto		$2\frac{3}{4}$
Longest claw of the hind feet		3
Shortest ditto		$1\frac{3}{4}$
Hair at tip of tail		$4\frac{1}{2}$
Length of the hair top of the head		$1\frac{3}{4}$ to 2
beneath the ears		$2\frac{1}{2}$ to $3\frac{1}{2}$
neck above — about		3
shoulders above		$4\frac{1}{2}$
throat		4
Belly and behind the anterior legs — longest hairs		6

NOTE [35]. Page 247.

Tyrannus verticalis, SAY. — *Head* above pure pale plumbeous; *vertex* with a bright orange spot; *back* pale plumbeous, very slightly tinged with olivaceous; *wings* brown; tertials margined exteriorly with white; inner webs of the primaries towards the base whitish, narrowed at their tips, the first feather remarkably so; *tail coverts* and *tail* deep brown black; exterior web of the lateral tail feather white; a dusky line before the eye; *chin* whitish; *neck* beneath, colour of the head; *breast*, *belly*, and *inferior tail coverts* bright yellow; *bill* furnished with clusters above, and each side at base; *superior mandible* perfectly rectilinear above, from the base to near the tip, where it rather suddenly curves much downward. Total length 8 inches; bill from the anterior edge of the nostrils to tip $\frac{1}{2\frac{1}{6}}$ of an inch.

NOTE [36]. Page 256.

R. *Tagetes*, JAMES. — Hirsute stem much branched, somewhat grooved; radical leaves subentive, spatulate, linear, or pinnatifiied; cauline leaves interruptedly pinnatifiied; the divisions irregular in form and position, but usually linear branches alternate or scattered; peduncles grooved short, few-flowered terminal; ray florets [$\frac{8}{8}$] recurved red brown; disk dark brown, receptacle columnar, but proportionably much shorter than that of R. columnaris, to which species the one under consideration is allied. Plant about twelve inches high, growing in clusters, and having, by its numerous branches and finely divided leaves, a remote resemblance to anthemis cotula.

NOTE [37.] Page 259.

Genus *Sciurus*. S. *Grammurus*, SAY. — Line-tailed squirrel. *Body* cinereous, more or less tinged with ferruginous; *fur* very coarse, much flattened, canaliculate above, plumbeous or blackish at base, then whitish or ferruginous, tip brownish; above the neck and shoulders the whitish is prevalent; from the middle of the back, the sides and the exterior surface of the legs, the ferruginous colour prevails, the terminal brown of the fur being obsolete; superior and inferior orbits of the eye white; *tail* moderate, whitish, fur triannulate with black, the base and tip of each hair being whitish, *beneath* whitish

tinged with ferruginous; *thumb tubercle* armed; *iris* burnt umber; *pupil* black.

Length to the origin of the tail, - 11½ inches.
of the tail, - - - 9 .

NOTE [38]. Page 269.

From a subsequent comparison of the direction of several water courses which descend from this elevated district, we have been induced to consider the creek mentioned in the text as one of the most remote sources of the great northern tributary of the Canadian river.

NOTE [39]. Page 276.

Since our return to Philadelphia, the following description of the animal has been drawn out from the dried skin, which, however, is so much injured by depredating insects, that it has not been judged proper to mount it entire. The head has therefore been separated from the remaining portion of the skin, and may be seen in the Philadelphia Museum, placed under the foot of a prairie wolf (canis latrans, SAY), which has been well prepared by Mr. T. Peale.

Cervus Macrotis, SAY. — Antlers slightly grooved, tuberculated at base; a small branch near the base, corresponding to the situation and direction of that of C. *Virginianus*; the curvature of the anterior line of the antlers is similar in direction, but less in degree, to that of the same deer; near the middle of the entire length of the antlers, they bifurcate equally, and each of these processes again divides near the extremity, the anterior of these smaller processes being somewhat longer than the posterior one; the ears are very long, extending to the principal bifurcation, about half the length of the whole antler; the lateral teeth are larger in proportion to the intermediate teeth than those of the C. *Virginianus* are; eye-lashes black; the aperture beneath the eye is larger than that of the species just mentioned, and pervious; the hair also is coarser, and is undulated and compressed like that of the elk (C. *major*); the colour is light reddish-brown above; sides of the head, and hair on the fore portion of the nose above, dull cinereous; the back is intermixed with blackish tipped hairs, which form a distinct line on the neck, near the head; the tail is of a pale reddish cinereous colour, and the hair of

the tip of the tail is black; the tip of the trunk of the tail is somewhat compressed, and is beneath almost destitute of hair; the hoofs are shorter and wider than those of the *Virginianus*, and more like those of the elk.

	Inches.
Length from the base of the antlers to the origin of the basal process,	2
of the basal process,	2½
from the basal process to the principal bifurcation,	4½ to 5
from the principal bifurcation to the two other bifurcations respectively,	4½ to 5½
terminal prongs of the anterior branch, from	4 to 4½
of the posterior branch, from	2¼ to 3
from the anterior base of the antlers to the tip of the superior jaw,	9¼
from the anterior canthus of the eye to the tip of the jaw,	6¼
from the base of the antler to the anterior canthus,	3
of the ears, more than	7½
of the trunk of the tail,	4
of the hair at the tip of the tail, from	3 to 4

This is probably the species mentioned by Lewis and Clarke, vol. i. p. 77., under the name of black-tailed deer,, and more frequently in other parts of the work, by that of mule deer. It is without doubt a new species, not having been hitherto introduced into the systems.

Note [40]. Page 287.

G. *linifoila*, Nuttall's Manuscript. — Stem erect, sparingly branched, smooth leaves, smooth sessile, alternate linear lanceolate entire, with the midrib translucent. Flowers in a terminal crowded spike; after flowering the rachis extends itself, and in the ripened fruit the spike is scattered; nut triquetrous, much shorter than the linear bractea.

The flowers are white, having in the calyx a tinge of brownish purple. They are about as large as those of G. coccinnea. The plant is three or four feet high, the leaves small and short, and the stem slender.

This is the fifth species of gaura we have met with west of the Mississippi. The G. biennis of the Eastern States has not hitherto been found here.

NOTE [41]. Page 325.

This elegant centaurea has a head of flowers nearly as large as that of the cincus lanceolatus, so commonly naturalized in the East. Some specimens from seeds, brought by Major Long, have flowered in Mrs. Peale's garden, near Germantown. The plant will be easily naturalized, and will be found highly ornamental.

END OF THE SECOND VOLUME.

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